

---

# **CORRECTIVE MEASURES WORK PLAN**

**SWMU 12/15 – SANITARY WASTE LANDFILL AND  
PESTICIDE DISPOSAL AREA  
TOOELE ARMY DEPOT  
TOOELE, UTAH**

---



**Final**

Prepared for:



Tooele Army Depot  
Environmental Office

Prepared by:



U.S. Army Corps of Engineers  
Sacramento District

---

May 2005

**TABLE OF CONTENTS**

## Section

1.0	INTRODUCTION .....	1
1.1	Scope of Remedial Action Plan .....	1
1.2	Site Description and History .....	2
1.2.1	Installation Location and History.....	2
1.2.2	Site Description.....	3
1.2	Physical Characteristics .....	3
1.3	Previous Investigations .....	4
1.4	Extent of Contamination .....	6
1.5	Recommended Corrective Measures Alternative .....	7
1.6	Project Points of Contact (POC) and Staffing .....	7
1.6.1	USACE Project Staff .....	7
1.6.2	TEAD Project POC.....	8
1.6.3	Regulatory POCs .....	8
2.0	ENGINEERING EVALUATION .....	8
2.1	Methodology .....	8
2.2	Observations and Findings.....	9
2.3	General Technical Approach .....	12
3.0	ADMINISTRATIVE REQUIREMENTS .....	13
3.1	Contractor Prepared Pre-Construction Requirements.....	13
3.1.1	Schedule.....	13
3.1.2	Contractor Quality Control .....	13
3.1.3	Site Safety and Health Plan (SSHP) .....	14
3.1.4	Pollution Prevention Plan .....	14
3.1.5	Site Security Plan.....	15
3.1.6	Munitions and Explosives of Concern (MEC).....	15
3.2	Quality Assurance.....	15
3.3	TEAD Security Passes .....	16
3.4	Permits .....	16
3.5	Utilities.....	16
3.6	Daily Paperwork .....	16
3.6.1	Photo Log.....	16
3.6.2	Daily Report.....	17
3.7	Corrective Measures Completion Report.....	17
4.0	TECHNICAL REQUIREMENTS .....	17
4.1	General.....	17
4.2	Pre-Mobilization Activities.....	18
4.3	Site Security .....	18
4.4	Protection of Existing Structures and Utilities.....	18
4.5	Preservation of Existing Cover .....	19
4.6	Clearing and Grubbing.....	19
4.7.	Borrow Area Excavation and Grading.....	19
4.8	Debris Pick-up and Re-location .....	20
4.9	Soil Placement .....	21

4.10	Road Repair .....	21
4.11	Fence Repair .....	22
4.12	Re-vegetation .....	22
4.13	Surveying .....	23
4.14	Inspection and Maintenance .....	23
5.0	REFERENCES .....	24

**ATTACHMENT 1: ..... Site Plans / Drawings**

**ATTACHMENT 2: .....Health and Safety Design Analysis**

**ATTACHMENT 3: ..... Site Photographs**

**ATTACHMENT 4: .....Field Note Forms**

**ATTACHMENT 5: ..... Inspection and Maintenance Plan**

**ATTACHMENT 6: .....Munitions and Explosives of Concern Support During Construction**

**ATTACHMENT 7: .....Borrow and Fill Calculations**

## ACRONYMS AND ABBREVIATIONS

AED	Ammunition Engineering Directorate
AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
APR	Air Purifying Respirator
bgs	below ground surface
BRAC	Base Realignment and Closure
CACM	Chemical Agent Contaminated Media
CAO	Correction Action Objective
CAP	Correction Action Permit
CDQMP	Chemical Data Quality Management Plan
CIH	Certified Industrial Hygienist
CMCR	Corrective Measures Completion Report
CMWP	Corrective Measures Work Plan
CMS	Corrective Measures Study
CO	Contracting Officer
COC	Contaminant of Concern
COPC	Contaminant of Potential Concern
COR	Contracting Officer's Representative
CPR	Cardiopulmonary Resuscitation
CSP	Certified Safety Professional
EES	Environmental Engineering Section
EO	Environmental Office
EPA	Environmental Protection Agency
FFA	Federal Facility Agreement
HDPE	High Density Polyethylene
HI	Hazard Index
HSDA	Health and Safety Design Analysis
HTRW	Hazardous, Toxic, and Radioactive Waste
HTRW-CX	Hazardous, Toxic, and Radioactive Waste – Center of Expertise
IRP	Installation Restoration Program
ITR	Independent Technical Review
IWL	Industrial Waste Lagoon
MEC	Munitions and Explosives of Concern
MM	Military Munitions
MSDS	Material Safety Data Sheet

NPL	National Priorities List
PM	Project Manager
POC	Point of Contact
QA/QC	Quality Assurance/ Quality Control
RA	Remedial Action
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SAP	Sampling and Analysis Plan
SHM	Safety and Health Manager
SHP	Safety and Health Program
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SVOC	Semi-Volatile Organic Compound
SWERA	Site-Wide Ecological Risk Assessment
SWMU	Solid Waste Management Unit
TEAD	Tooele Army Depot
TCLP	Toxicity Characteristic Leaching Procedure
TSDF	Treatment, Storage, and Disposal Facility
UAC	Utah Administrative Code
UDEQ	Utah Department of Environmental Quality
USACE	United States Army Corps of Engineers
USSCS	United States Soil Conservation Service
UXO	Unexploded Ordnance
VOC	Volatile Organic Compound

---

**CORRECTIVE MEASURES WORK PLAN**  
**SWMU 12/15 – SANITARY LANDFILL AND**  
**PESTICIDE DISPOSAL AREA**  
**TOOELE ARMY DEPOT, TOOELE, UTAH**

---

## **1.0 INTRODUCTION**

### **1.1 Scope of Remedial Action Plan**

This Corrective Measures Work Plan (CMWP) is being prepared by the U.S. Army Corps of Engineers (USACE) on behalf of the Tooele Army Depot (TEAD), and shall be used to obtain regulatory concurrence with the plan prior to having a remediation contractor execute the plan. Solid Waste Management Unit (SWMU) 12/15 is located at the east side of the Depot, immediately southwest of Utah Industrial Depot (formerly the TEAD industrial area). The boundaries of the SWMU encompass approximately 100 acres, with approximately 67 of those acres containing disposed debris. The Corrective Measures Study (CMS) Report (URS 2003) recommended improvement of the soil and vegetative cover, continued groundwater monitoring, and land use controls as the most appropriate corrective measure for SWMU 12/15. This CMWP includes activities to implement soil and vegetative cover improvements as well as perimeter fence repairs. Groundwater monitoring is incorporated into the Depot-wide groundwater monitoring program.

This CMWP is comprised of a Remedial Action Plan (RAP) with construction drawings and specifications, and a Health and Safety Design Analysis (HSDA). The RAP describes the work process required to implement the recommended alternative for SWMU 12/15. The HSDA is used as the basis for developing the specifications for the site-specific safety and health plan for work at SWMU 12/15. Specifically, it provides the rationale and decision logic for the information to be addressed in the contractor's Site Safety and Health Plan (SSHP). Together, the RAP and HSDA are referred to as the CMWP. All activities within the CMWP shall be executed by the remedial action contractor.

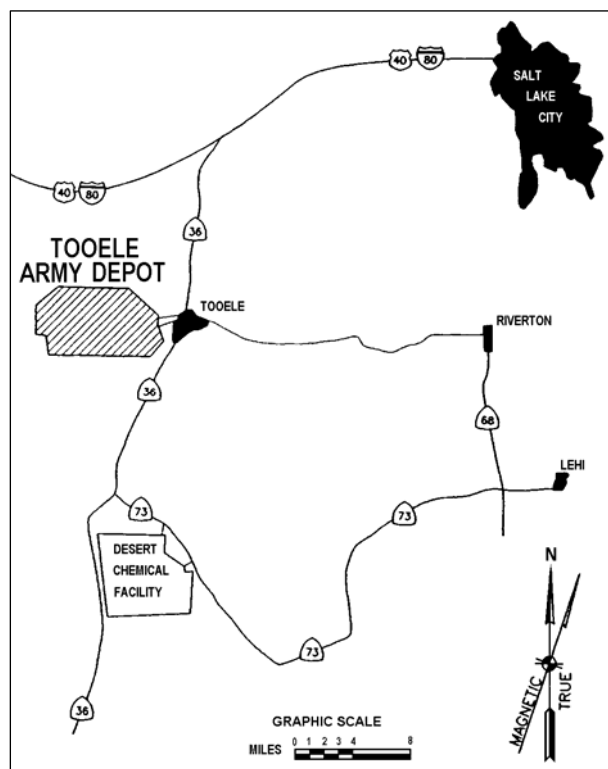
## 1.2 Site Description and History

### 1.2.1 Installation Location and History

TEAD is located approximately 35 miles southwest of Salt Lake City, Utah and directly west of the City of Tooele. The Tooele Ordnance Depot was established by the U.S. Army Ordnance Department in April 1942. Tooele Ordnance Depot assumed command of the Deseret Chemical Depot, located 17 miles south of Tooele, in 1949. The TEAD was re-designated as Tooele Army Depot – North in August 1962.

Deseret Chemical Depot was realigned in 1996 and the designation of North was removed from TEAD's name. A portion of TEAD was placed on the Base Realignment and Closure (BRAC) list in December 1998. Prior to TEAD's inclusion on the BRAC list, the primary mission was the storage, maintenance, and demilitarization of military vehicles, topographic equipment, troop support items, power generators, and conventional munitions. The realignment transferred all vehicle and equipment duties to Red River Army Depot in Texas. The current mission of TEAD is the storage, maintenance, and demilitarization of conventional munitions.

Figure 1



Because of past activities at the installation, TEAD was included in the U.S. Army's Installation Restoration Program in 1978. TEAD was placed on the National Priorities List (NPL) in 1990. A Federal Facility Agreement (FFA) was entered into between the U.S. Army, U.S. Environmental Protection Agency (EPA) Region 8, and the State of Utah in 1991. As a result of past operations and environmental investigations, a number of sites on the installation have been identified and designated as SWMUs and a Resource Conservation and Recovery Act (RCRA) Post-Closure Permit was issued by the State of Utah in 1991. The permit expired in January 2001. A new RCRA Post-Closure and corrective action permit (CAP) was issued to TEAD in February 2001. This CAP requires actions at 42 SWMUs. SWMU 12/15 is one of the 42 SWMUs identified in the CAP and is one of the subset of SWMUs called the Known Release

SWMUs. Much of the site investigation for SWMU 12/15 was performed together with all the Known Release SWMUs.

### **1.2.2 Site Description**

SWMU 12/15 is located In the east portion of TEAD, immediately southwest of the Utah Industrial Depot (formerly the TEAD industrial area). (Figure 2). Since 1942, approximately 67 acres of the 100-acre site have been used for disposal of waste. Disposed wastes are reported to include: scrap metal, tires, paper, garbage, scrap wood, untreated paint sludge, grease and oil, metal plating waste, paint containers, empty paint thinner and stripper containers, battery acid containers, insecticide and herbicide containers, asbestos containing materials, and ethylene glycol. The waste was initially buried in trenches, and in later years was placed in natural depressions and covered with soil from the surrounding area. No disposal of hazardous wastes occurred after October 1980, when the TEAD RCRA Management Plan was implemented. Disposal of domestic waste was halted in spring 1994. Disposal of construction debris, asphalt, and asbestos was halted in spring 1996 (URS 2003).

## **1.2 Physical Characteristics**

The site topography is dominated by an arroyo that trends through the middle of the landfill from the southeast to northwest. Outside of the arroyo, the overall ground surface slopes to the northwest from an elevation of 4790 ft. at the east side of the landfill, to an elevation of 4740 at the west side. There are large areas of very gentle slope at the northeast and southwest portions of the landfill. In and near the arroyo, the ground surface is more irregular. Much of this irregularity is likely attributable to the reported place-and-cover activities, as the soil appears to be disturbed from natural condition.

The soils at the site are predominantly gravel, sand, and silt. There is considerable evidence at many locations that the soil has been manipulated. At some locations, there are mounds of gravel, with insignificant finer grained material. Groundwater is found at depths of approximately 300 feet below ground surface (Kleinfelder 2004).

The arroyo is a geologic feature that appears to be a surface water drainage feature; however actual surface drainage through this feature may have ceased many years ago. Roads have been built across it and the TEAD barracks and administrative areas appear to have been



built in an area that would have been an upstream part of the arroyo. TEAD personnel report never having seen water flowing through the arroyo.

Greater detail of the site physical characteristics may be found in the Final RCRA Facility Investigation (RFI) Report, Phase II (RUST E&I, 1996).

### **1.3 Previous Investigations**

Prior to the Phase II RFI, site investigations at SWMU 12/15 focused on groundwater contamination. Through the course of those investigations, fifteen monitoring wells were installed and sampled. Contaminants of potential concern (COPC) were identified as Volatile Organic Compounds (VOC), Semi-volatile Organic Compounds (SVOC), hexahydro-1,3,5-trinitro-1,3,5 triazine (RDX), metals, and pesticides, with VOCs being the predominant contaminants.

The Phase II RFI (RUST E&I, 1995) provided the most comprehensive soil evaluation and the most rigorous attempt at source point delineation for SWMU 12/15. Sampling activities performed in this effort included:

- Soil vapor survey – 116 shallow locations on a 200-foot by 200-foot grid.
- Surface soil samples at 30 of the grid nodes – some, but not all, biased toward VOC detections in the soil vapor survey.
- Test pits at 15 of the grid nodes.
- Installation of one additional monitoring well.
- Two rounds of groundwater sampling at 16 wells.

The soil vapor survey located a large area in the west part of the landfill with elevated VOCs, and a focused small area in the north central part of the landfill. Soil sampling revealed concentrations of metals, VOCs, SVOCs, pesticides, and Aroclor 1260 above accepted background values. Contaminants of concern (COC) were determined by comparing the data for all contaminants of potential concern (COPC) to the corrective action objectives established for the project. The COCs for surface soil were ultimately determined to be arsenic, chromium, dieldrin, and several carcinogenic PAHs. The concentrations were distributed throughout the landfill. The distribution and concentrations of the contaminants provided no indication of specific release points. The test pits revealed general refuse disposal in the southern and north-

central areas, construction debris in the northeast area, and very little debris in the west area, including the former sewage evaporation ponds.

The groundwater monitoring confirmed that VOCs are the primary groundwater contaminant, with the other contaminants only detected at sporadic trace levels. The highest VOC concentrations were found in N-119-88, down-gradient of the north-central part of the landfill; and N-120-88, which is cross-gradient of the same area. It was postulated that the VOCs in N-120-88 may have come from the IWL ditches.

The risk assessment performed as part of the Phase II RFI identified risks requiring action in accordance with UAC R315-101-6(d) as listed below.

<b>Summary of Human Health Risks</b>		
Land Use/Receptor	Cancer Risk	Hazard Index
<i>Target Risk - Residential</i>	1.0 x 10 <sup>-6</sup>	1.0
<i>Target Risk - Military</i>	1.0 x 10 <sup>-4</sup>	1.0
Current Depot Personnel	1.5 x 10 <sup>-5</sup>	0.18
Future Resident – Adult	1.4 x 10 <sup>-3</sup>	27
Future Resident – Child	7.5 x 10 <sup>-4</sup>	37
Future Construction Worker	1.2 x 10 <sup>-6</sup>	1.6

A Site-wide Ecological Risk Assessment (RUST E&I, 1997) concluded that there was potential for ecological risk at SWMU 12/15.

The CMS was begun in 2000, and reported together with all the known release SWMUs at TEAD in the draft submittal. During the development of the CMS, it was determined that SWMU 12/15 would require further study, and thus it was separated from the other known release SWMUs in subsequent documents. In addition, during the ongoing groundwater investigations for SWMUs 2 and 58, it was suggested that groundwater contamination should be managed in a comprehensive, depot-wide manner; rather than on an individual source basis. It was determined that corrective actions at SWMU 12/15 would address soil contamination, and groundwater contamination would be addressed within the context of the SWMU 2/58 groundwater program.

An exploration trenching investigation was performed in 2001 (MWH, 2002) to provide

supporting data for the finalization of the CMS and subsequent corrective measures design. A total of 249 trenches were excavated to provide a more accurate delineation of the boundaries of the disposed debris.

An additional groundwater monitoring well, C-40 was installed in the north-central part of the landfill in April 2002. Analytical results from this well have been among the highest at SWMU 12/15, similar to the higher levels found in wells N-119-88, N-150-97, and N-120-88.

The CMS, for SWMU 12/15 alone, was completed in 2003 (URS, 2003). Three corrective measures alternatives were evaluated. All three alternatives included groundwater monitoring and land use restrictions. The three alternatives differed in the manner of how the land surface would be covered:

- 1) Multi-layer Landfill Cap
- 2) Evapo-transpiration Landfill Cover
- 3) Improve Existing Soil and Vegetative Cover.

All three alternatives were determined to provide adequate protectiveness; and alternative three was selected as the most cost-effective. That alternative provides the basis for this CMWP.

#### **1.4 Extent of Contamination**

This corrective measure is designed to address the shallow soil contamination at the site. Groundwater beneath and down-gradient of the site is contaminated. The primary contaminants in groundwater are VOCs, although other contaminants have been detected sporadically at trace concentrations. Groundwater contamination will be managed under the groundwater program being implemented under SWMUs 2 and 58. In the event that corrective measures for deep VOC contamination are recommended to protect groundwater, they will be implemented under the SWMU 58 program. The SWMU 12/15 corrective measure will not constrain such activities.

The soil contamination is presumed to be associated with the refuse placed in the landfill. An extensive exploration trenching project was performed in 2001, which provides the most detailed assessment of the nature and extent of the refuse. The report of this effort (MWH, 2002) provides descriptions of debris encountered in each of 249 trenches, as well as a map delineating the extent of the buried debris, based on the trench data. The mapping of the buried waste is incorporated onto plates C-3 through C-9 of this RAP. Generally, much of the debris is located along the arroyo, which runs from the southeast to the northwest of the SWMU.

## **1.5 Recommended Corrective Measures Alternative**

The CMS Report (URS 2003) concluded that the most appropriate alternative for SWMU 12/15 includes improvements to the soil and vegetative cover, groundwater monitoring, and land use controls. This alternative has the following components:

1. Perform an engineering evaluation to determine which areas of the landfill require cover improvements or additional vegetation. From this evaluation, the design (this work plan) for the field work will be developed.
2. In areas where surface debris is found, and can be easily removed without exposing more debris, pick up the debris and relocate it to consolidation points within the landfill.
3. Provide a minimum of 24 inches of soil cover over areas of exposed buried debris and consolidated surface debris.
4. Re-seed all areas of new soil cover in order to prevent erosion by wind or surface run-off. Re-seed other areas of the landfill that have potential for exposure of buried debris due to erosion, based on the engineering evaluation.
5. Repair fence around SWMU 12/15 where needed.
6. Perform periodic inspection and maintenance of the landfill cover. The inspection and maintenance requirements will be similar to those for the Industrial Waste Lagoon (SWMU 2).
7. Monitor the groundwater beneath and down-gradient of the landfill semi-annually. This requirement is incorporated into the Depot-wide semi-annual monitoring program.
8. Land use restrictions are incorporated into the TEAD's master land use plan. Additionally, construction activities are not allowed without a construction health and safety assessment subject to TEAD Environmental Office approval.

## **1.6 Project Points of Contact (POC) and Staffing**

### **1.6.1 USACE Project Staff**

The Environmental Engineering Branch of the Sacramento District, U.S. Army Corps of Engineers (USACE) has prepared this RAP under the general supervision of Roger Henderson,

P.E. at (916) 557-5378. The Project Manager for this project is April Fontaine at (916) 557-7699. The Technical Team Leader for the project is Doug Mackenzie, P.E. at (916) 557-6996.

### **1.6.2 TEAD Project POC**

The person representing TEAD in this project is:

Larry McFarland

SJMTE-CS-EO

1 Tooele Army Depot Bldg. T8

Tooele, Utah 84074-5033

Ph. (435) 833-3235

Fax: (435) 833-2839

e-mail: [mcfarlal@emp2.tooele.army.mil](mailto:mcfarlal@emp2.tooele.army.mil)

### **1.6.3 Regulatory POCs**

The regulatory agencies for this project are: USEPA, Region 8, and UDEQ, Division of Solid and Hazardous Waste. The names and addresses for these POCs are:

Helge Gabert

State of Utah

Department of Environmental Quality

Division of Solid and Hazardous Waste

288 North 1200 West

Salt Lake City, Utah 84114-4880

Ph. (801) 538-6170

Jim Keifer

U.S. EPA, Region 8, 8EPR-F

999 18<sup>th</sup> Street, Suite 300

Denver, Colorado 80202

Ph. (303) 312-6907

## **2.0 ENGINEERING EVALUATION**

### **2.1 Methodology**

The design team acquired the electronic files for Plate 1 from the Exploration Trenching Report (MWH, 2002) to serve as the base map for the design plans. This plate includes the latest topographic survey, exploration trench locations, inferred buried waste delineation, roads, fences, and miscellaneous site features. For the design, layers are added to the CADD files of this map to show the various construction activity areas.

On 17-18 November 2004, the following personnel participated in an extensive site walk to gather design data for the remedial action at the landfill:

- Doug Mackenzie, Environmental Engineer, Project Technical Lead
- Erik Gabele, Civil Engineer, Civil Designer
- Tom Knapp, Ordnance and Explosives Specialist
- Carl Cole, Geologist

During the site walk several activities were performed:

1. Site topography was qualitatively compared to the topographic contours on the base map.
2. Sixty global positioning system (GPS) survey readings were taken to verify surface elevations on the base map, and to provide for mapping of various points of interest.
3. Observations of surface conditions were recorded on field log forms (Appendix A). At each GPS survey point, observations were recorded with respect to quantity and character of surface debris, vegetation, topography, and erosion potential.
4. Several photographs were taken to document site conditions.
5. The ground surface was evaluated for potential ordnance and explosives (OE).
6. The entire fence line was inspected for integrity.

Following the site visit, the local office of the Natural Resources Conservation Service (NRCS) was contacted for input regarding preferred plant species for re-vegetation. Criteria for selection of plant species include ease of planting and low maintenance.

Based on recommendations from the CMS and the data accumulated for this evaluation, various areas of the landfill were categorized based on specific types of action (eg. Pick up debris and re-locate, cover debris in place, no action, etc). These areas were then outlined on the site map.

## **2.2 Observations and Findings**

The ground surface conditions varied widely at the landfill, but those areas could be grouped into relatively few general remedial action activities. The following observations and findings formed the basis for design of the remedial action activities.

1. The topographic map matched the observed topography well.
2. The weather at the time of the site walk varied between overcast to sunny. The region had received approximately three inches of rain in October, and another one-half inch from 8-12 November, but the ground surface was relatively dry at the time

of the site visit. No ponded water was observed, with the exception of a low spot in the road at the bottom of the arroyo in the center of the landfill.

3. Activities related to the corrective measures for SWMUs 6 and 8 were underway at the landfill. The Contractor for those activities had created a soil processing work space at the top of the concrete rubble area northeast of the old sewage lagoon area. They had placed and compacted imported road base material to provide a stable working surface. The Contractor was also placing soil in the Corrective Action Management Unit CAMU at the northwest area of the landfill after processing. These two locations were left in a state that will satisfy the objectives of the SWMU 12/15 corrective measure.
4. The vegetative cover is satisfactory over nearly all areas of the landfill. In reviewing prior site reports for information regarding vegetative cover and comparing that information to current observations, it is apparent that the robustness of the vegetation has continued to improve over time since landfilling activities ceased.
5. The only areas where vegetation was sparse, aside from the roads and SWMU 6 and 8 work areas, were those areas where the surface material was mostly gravel. There was a direct relationship between the density of vegetation and gravel content of the surface soil.
6. There were many areas where surface debris was present, but not in a manner that indicated exposure of buried debris. The items of debris were lying on the surface, with few seen imbedded in the ground. In these areas, the soil cover appeared adequate. The term “surface litter” will be used in this document to describe observations of surface debris of this type.
7. In a smaller number of areas, a considerable amount of debris was observed at the surface, as a result of inadequate cover. The term, “exposed debris” will be used in this document to describe these observations of debris.
8. There was no evidence of any erosion occurring in recent years.
9. No evidence of unexploded ordnance was observed on the ground surface anywhere at the landfill.

10. The greatest amount of debris was observed in the southeast leg of the landfill, east and southeast of the guard building. Areas of exposed debris were observed, as well as considerable surface litter. The areas of exposed debris appeared to be the result of inadequate cover and perhaps settlement of mounded debris. At the far south end, only moderate surface litter was observed.
11. Further south in the southeast leg, moderate surface litter was observed. A gravel embankment is located west of this section.
12. Northeast of the arroyo is a large area with no exposed debris and minimal surface litter, approximately 50 to 200 feet between observed items of debris. The area is well vegetated and has little slope.
13. Pockets of exposed debris were observed in the far north section, north of the arroyo (Plate C-3).
14. Some areas of significant surface debris were observed within the arroyo in the far north section (Plate C-3).
15. A large concrete rubble disposal area was noted in the north central area in previous investigations. This area is along the southwest side of the arroyo and forms a significant slope that curves from an east-facing direction to a north-facing direction. Some concrete was observed protruding from the slope. A minimal amount of surface litter was also observed, mostly near the base of the slope. The slope appears to be well vegetated and stable.
16. At the northwest corner of the concrete rubble disposal area is a small area of exposed debris. At this location, at the top of the slope, it appears there may have been some slumping. The exposure of debris may have also been a result of construction activity on the sewer line that passes through the area. Whichever activity caused the exposure likely occurred several years ago, as evidenced by well-established vegetation.
17. No debris was observed in the abandoned sewage lagoons, with the exception of a few sections of ceramic pipe at the northeast corner. The berms had concrete structures with pipes through them. There were two small mounded areas of debris along the north side of the lagoons. The area was well vegetated and relatively flat, though a small depression was observed to the east of the lagoons.



18. The asbestos disposal area is well covered and well vegetated. A few areas of modest surface litter were observed. In some instances, this litter may have been asbestos containing material (floor tile, transite wallboard, fabric). At one small location (~ nine square feet), some of this material was imbedded in the ground.
19. South of the asbestos area, there was no exposed debris, and observations of surface litter were sporadic, at best. The area is gently sloped and well vegetated.
20. The fence around the SWMU is mostly in good condition. It varies between three strand and five strand barbed wire. There is one section, approximately 20 feet, at the southwest boundary where the barbed wire is missing. Otherwise, there are a small number of locations where there is one strand broken, or excessively loose strands.

### **2.3 General Technical Approach**

The approach to this RAP consists of the following work items to be performed by the contractor:

1. Identify and stake boundaries for the borrow areas and fill areas indicated in the attached plan. .
2. Identify locations for consolidating collected surface debris as indicated in the attached plans.
3. Fill in void areas identified in the attached plans with medium sand obtained from an off-post source. After voids have been filled and vibrated with vibratory equipment, cover exposed debris with a minimum of 24 inches of material obtained from on-post borrow areas. Seed for re-vegetation.
4. Collect debris from the areas indicated within the attached drawings.
5. Haul, consolidate, and cover the debris with a minimum of 24 inches of soil in the designated locations. Seed area for re-vegetation.
6. Fill with at least 24 inches of soil all areas indicated on the attached plans as areas for debris consolidation, even if area was not used to consolidate debris. Provide seeding for re-vegetation.
7. One sanitary sewer manhole lies within a pile of concrete rubble and other debris. Contractor shall raise the manhole rim, using pre-cast concrete rings, and install soil cover as indicated on the plans.

8. Raise the elevation of a 12-foot wide dirt road as indicated within the attached plans.
9. Prior to earth moving, contractor shall evaluate entire area within the boundary identified as “Approximate SWMU 12/15 Boundary” and collect surface litter for consolidation.
10. Contractor shall repair and replace barbed wire fence where required.
11. Contractor shall provide a topographic survey of finish grade elevations where borrow was excavated and debris and/or fill were placed.

Refer to Section 4, Technical Requirements for a detailed description of work to be performed.

### **3.0 ADMINISTRATIVE REQUIREMENTS**

#### **3.1 Contractor Prepared Pre-Construction Requirements**

##### **3.1.1 Schedule**

The Contractor shall develop a schedule for this project using a Gantt chart. The schedule shall outline proposed dates for document submittals and work activities. The schedule shall be reviewed and approved by TEAD POCs, USACE personnel, and Regulatory personnel. The Contractor shall coordinate all scheduling deviations with the USACE Contracting Officer's Representative (COR).

##### **3.1.2 Contractor Quality Control**

The Contractor shall implement a comprehensive Quality Control (QC) program to ensure that all work on the project, including that of subcontractors and vendors, complies with the requirements of the contract. The quality control will make use of a three-phase control approach as described below:

- Preparatory Phase: before initiation of each definable item of the work, a comprehensive review of all essential elements contributing to the completion of that item must be undertaken. Subjects for the review include documents, materials, testing procedures, permits and approvals, hazard potentials, and an examination of the site.

- Initial Phase: at the inception of each definable feature of work, the methods, workmanship, testing procedures and safety practices being employed in the conduct of that work must be reviewed.
- Follow-up Phase: daily checks must be made to ensure the continued compliance of ongoing work. Final follow-up quality control inspections will be conducted for each completed feature of work before any follow-on work is begun.

The documentation and materials used to establish quality control in each phase may be audited by USACE to assure proper procedures are in place.

The Contractor shall prepare a Contractor Quality Control Plan (CQCP) in accordance with the USACE specifications. The plan will describe the site-specific components of the quality control program including the personnel, procedures, controls, instructions, tests, records, and forms to be used.

### **3.1.3 Site Safety and Health Plan (SSHP)**

The Contractor shall develop a SSHP, which will address all safety and health issues pertaining to work activities, particularly any hazardous components which are anticipated. The SSHP shall also address all safety and health issues described in the Health and Safety Design Analysis (Attachment 2). All Contractor personnel must be familiar with the requirements of the SSHP. Additionally, no Contractor personnel will be allowed within the construction zone without having completed the 40-hour Health and Safety Training for Hazardous Waste Workers and a current 8-hour refresher certificate, if required. The SSHP must be reviewed and approved by the USACE prior to any field activities.

### **3.1.4 Pollution Prevention Plan**

The Contractor shall prepare a Pollution Prevention Plan detailing the methods to be used to control various forms of pollution during field activities and submit it to USACE for review and approval. The plan shall include procedures for dust control, run-on/runoff control, waste disposal, and spill prevention. A contingency plan for spills and leaks shall also be included.

### **3.1.5 Site Security Plan**

The Contractor shall prepare a Site Security Plan for the site and submit it to USACE for review and approval. The plan shall include all aspects of site security and access.

### **3.1.6 Munitions and Explosives of Concern (MEC)**

There are no records indicating disposal of MEC at the landfill, nor have there been any observations of MEC on the ground surface or in trenches excavated during the trenching investigation. Due to the nature of some past and present operations at TEAD, precautions still must be taken during intrusive activities at the landfill. Attachment 6 provides general procedures for MEC support during construction. The Contractor's SSHP will include sections to specifically address the MEC procedures per Attachment 6.

## **3.2 Quality Assurance**

The Army will perform quality assurance evaluation of the Contractor's work. An Army representative will visit the site daily during construction activities to verify the effectiveness of the Contractor's quality control program. The work will be evaluated for conformance with the work plan as well as conformance with the general objectives of the project. Discrepancies will be identified to the Contractor's QC representative immediately upon discovery. Specific activities to be observed include:

- Tailgate meetings
- Staking of borrow, fill, and pick-up areas.
- Site security
- Quality control measurements and other QC activities
- All field construction activities specified in Section 4.0

The Contractor's daily field reports will be reviewed to ensure all critical elements of the work and quality control are documented. The Army representative will be available daily to assist with interpretation of conditions that may require a field decision before proceeding with work. The Army representative will consult with TEAD and Regulatory staff, if appropriate, for input on the decision. The Contractor will be required to document field changes and variances from the work plan in the daily field reports and in the Corrective Measures Completion Report.

Upon completion of soil placement, and before seeding, the Contractor will be directed to excavate potholes in up to 12 locations identified by the Army representative. The thickness of cover will be measured and recorded to verify that the minimum of 24 inches has been achieved.

### **3.3 TEAD Security Passes**

Current TEAD security requirements do not include the need for security passes in several parts of the Depot, including SWMU 12/15. Security passes are required for access to the ammunition area, which borders SWMU 12/15 on the northwest. Access through the northwest gate and fence repairs at the northwest portion of the site will necessitate obtaining security passes. All motor vehicles will require vehicle passes.

All Contractor personnel required to work on site for the remedial action must be American citizens or resident aliens with a work permit (green card). No foreign nationals (without a green card) will be allowed on site. This is required because these personnel must obtain security passes from the Installation Security Office. The USACE on site representative, Carl Cole, (435) 833-3341, can assist in this process.

### **3.4 Permits**

The Contractor shall obtain an excavation permit from the Directorate of Public Works and Logistics, Tooele Army Depot. Prior to the start of excavation, this permit will be approved by appropriate divisions within TEAD, including the Utilities Division, Communications Contractor, Coaxial Cable Manager, Chief Environmental Office, Engineering Division, and Director Public Works and Logistics. A permit shall also be obtained by coordination with the TEAD POC for use of a camera on site.

### **3.5 Utilities**

The Contractor is responsible for providing power, water, sanitation, and any other facilities required at the site. Electric power is available at the landfill, other utilities are not. Prior to the start of work, the Contractor will enter into a service agreement with the Directorate of Public Works for utilities provided. The Contractor shall reimburse TEAD for any utilities provided by the installation. All costs to connect to and disconnect from TEAD utilities are the responsibility of the Contractor.

### **3.6 Daily Paperwork**

#### **3.6.1 Photo Log**

Photographs will be taken to document all unique features of work. The photographs

shall include, at a minimum, pre-construction conditions, work in progress, and the finished site.

### **3.6.2 Daily Report**

The Contractor's quality control (QC) personnel shall maintain a daily report. The report shall include, at a minimum, all activities undertaken at the site, including the time and date undertaken, visitors at the site, problems encountered and resolution, excavation equipment used, and names and roles of Contractor's personnel at the site.

### **3.7 Corrective Measures Completion Report**

Upon de-mobilization from the site, the Contractor shall prepare a Corrective Measures Completion Report (CMCR) detailing work performed. The CMCR shall include, at a minimum:

- A summary describing work performed with details of any deviations from the RAP;
- As-built drawings showing the limits and surface topography of excavations and fill areas;
- Descriptions of any problems encountered during the progress of the work and actions taken to resolve the problems;
- Attachments containing a complete photo log of the work accomplished;
- Field test results;
- Copies of Daily Reports;

The CMCR shall be submitted to USACE for review and approval, prior to submittal to UDEQ.

## **4.0 TECHNICAL REQUIREMENTS**

### **4.1 General**

The Remedial Action Contractor (RAC) shall carry out the activities described in this RAP. QA oversight will be performed by USACE personnel. The Contractor shall have QC personnel on site at all times. Remediation activities at the site include:

- Excavating native soil from non-impacted areas within the SWMU to use as cover material;
- Collecting loose surface litter and consolidating it at specified low areas;

- Covering exposed debris and consolidated surface litter at selected sites with approximately 24 inches of soil;
- Re-seeding areas of disturbed soil;
- Repairing the SWMU 12/15 boundary fence.
- Inspection and maintenance of the landfill cover (not performed by the RAC).

#### **4.2 Pre-Mobilization Activities**

Prior to mobilization, the Contractor shall coordinate with USACE and TEAD POCs to set up appropriate staging areas. The Contractor shall obtain all necessary permits and licenses for excavation at TEAD, as described in Paragraph 3.3.

#### **4.3 Site Security**

The Contractor shall maintain security at SWMU 12/15 by controlling access through the existing boundary fence and gates during construction and shall establish and follow check-in and check-out procedures. All project materials and equipment will remain inside the perimeter fencing during non-working hours. The Contractor may be allowed to install one additional gate in the SWMU 12/15 perimeter fence along the east side at a location that does not border on the Utah Industrial Depot. Location of the gate must be coordinated through the TEAD POC. The existing perimeter fencing will include locking gates to provide access to the site for workers and equipment. Personnel other than the Contractor's staff requiring access to the SWMU include: TEAD Environmental Office, TEAD Security, TEAD Public Works, USACE.

Additional security measures, other than the security fence, will be employed around the excavation and placement areas. These measures will be elaborated in the Contractor's Site Safety and Health Plan.

#### **4.4 Protection of Existing Structures and Utilities**

Any surface or subsurface infrastructure and utilities shall be protected during the construction and site cleanup activities. Any damages to existing structures and utilities will be corrected to the original conditions or as approved by the COR. One manhole located at the northwest edge of the concrete rubble site must be vertically extended to accommodate covering of debris in the immediate vicinity. Any modifications to utilities must be coordinated through TEAD Public Works. Access to existing monitoring wells must be preserved.

#### **4.5 Preservation of Existing Cover**

All activities will be performed in a manner to minimize disturbance of the existing landfill cover and vegetation. Existing roads and access trails will be used for vehicular traffic to the fullest extent possible. Access routes for earthmoving equipment will be established based on considerations of safety and shortest path from existing roads. Temporary gates may be installed, upon approval of the TEAD POC, in the SWMU boundary fence to facilitate safer and less destructive access to areas where earthmoving is required. In areas where only surface debris pick-up is required, lightweight vehicles will be used for debris collection.

#### **4.6 Clearing and Grubbing**

Following mobilization of personnel and equipment, the site preparation activities will start. Site preparation consists primarily of visual inspection of the entire site and physically locating (typically staking) the various defined work features as indicated on the drawings. Clearing & grubbing operations will be performed only as necessary to properly accomplish the indicated work activities. These operations will include full removal of vegetation or other surface materials at the borrow area prior to borrow material excavation, and will also include removal of trees and large/tall shrubs and excess vegetation in areas to be covered. Clearing will likely be performed by mechanical means and all removed materials will be placed within the SWMU boundaries. The stripped surface material from the borrow area will be stockpiled and replaced once borrow operations are complete. Vegetation removed from the filled areas can be “flattened” by on-site construction equipment and placed within consolidation areas with collected debris.

#### **4.7 Borrow Area Excavation and Grading**

The Contractor will strip surface materials to a minimum depth of four inches and stockpile it on site for future placement as topdressing if suitable; any unsuitable materials such as stones, litter, or debris will be disposed at debris consolidation locations as specified in Section 4.8. Excavated slopes will generally be cut at approximately 10 horizontal to 1 vertical but slopes shall not exceed 4 horizontal to 1 vertical, and all excavations will be performed in a manner to efficiently utilize existing adjacent drainage features/patterns both during construction and upon completion. Dust and erosion control activities will be performed for all excavated



areas during construction. Each excavation area will be finish graded as indicated on the drawings.

Preferred borrow areas are identified on the drawings. In general, it is anticipated, and preferred that all borrow soils will be obtained within the fence line of SWMU 12/15. If inadequate quantities of cover soil are available in the identified areas, a large area in the southwest portion of the SWMU appears to contain no buried debris (MWH 2002) and may be considered. In addition, the Contractor may identify other smaller areas within the SWMU boundary that might not contain debris. In the interest of reducing the cover material hauling distances, these areas may be considered for borrow if the Contractor can verify that it is free of debris. Verification will be provided by trenching. If soil must be brought in from outside the SWMU, the Contractor will coordinate with the TEAD Environmental Office to locate another on-Depot source of un-affected soil, and will transport the soil from that source. Excavation will cease at any location where buried debris is discovered.

#### **4.8 Debris Pick-up and Re-location**

There is a potential for surface debris throughout the entire area identified on the plans as “Approximate Boundary SWMU 12/15”, although some areas contain more debris than others. The entire area within the boundary identified on the drawings as “Approximate SWMU 12/15 Boundary” shall be inspected for surface debris. Refer to the attached plans for mapping of known debris areas. Debris on the surface shall be picked up by hand or typical construction loaders. Wood and other organic debris items larger than 10 inches in any dimension shall be collected. Inorganic debris items larger than four inches in any dimension shall be collected. The large structural concrete structural items at the abandoned sewage evaporation pond area may be left in place. Collected debris shall be brought to areas identified on the drawings for consolidation. Large items protruding through the surface or exposed debris located on top of a larger debris deposit shall be covered with a minimum of 24 inches of soil from the on-site borrow areas. Items protruding through the surface such as steel re-bar and banding material can be cut off at grade. Debris shall be spread out and covered with soil from the borrow area to the grades indicated. If the attached plans do not indicate sections or finish grade at these areas then a minimum of 24 inches of cover shall be placed followed by re-vegetation.

#### **4.9     Soil Placement**

Soil placement will consist of spreading and compacting excavated borrow soil materials to cover exposed or consolidated debris as indicated on the drawings. Soil placement areas and excavated borrow areas will be finish graded as indicated on the drawings and specified herein, to provide effective drainage while minimizing erosion. Soil will be placed at various slopes but in all cases (except as allowed for benches per below) no steeper than a maximum slope of 2 horizontal to 1 vertical, which will result in a significant amount of fill around existing steep items/features (e.g. at the sewer manhole north of the inactive sewer lagoons on Sheet C3). For locations with a slope height (vertical) greater than 6 feet, soil materials will be placed in maximum 12-inch thick lifts and each lift leveled and then compacted as verified by ASTM D 2922 testing to at least 90 percent of the ASTM D 1557 laboratory maximum density. These are the only locations that will require Proctor and verification density testing. Benches shall be provided for these locations at maximum 4-foot vertical spacing as a runoff break, i.e. to minimize erosion. Minimum bench width shall be 18 inches and the slope of the soil face may be increased to a maximum of 1.5H:1V, provided that the overall slope is not steeper than 2H:1V as specified. For mildly sloped grading areas to receive less than 36 inches of fill, soil materials will be placed in maximum 2-foot thick layers, graded/leveled, and then compacted with a minimum of 2 passes of a steel-wheel roller or 3 passes of the soil\_spreading equipment. Soil fill to raise an interior dirt road will be placed and compacted as described under “Road Repair”.

One location identified on Sheet C-8 had significant voids in the exposed debris. There is a potential safety hazard of collapse of the ground surface under the weight of construction equipment. In addition, fill material may infiltrate into the voids over time, resulting in localized loss of cover. The Contractor will fill these voids with clean, dry, medium or medium-coarse sand to reduce the potential safety hazard and potential future cover repairs.

#### **4.10   Road Repair**

An approximately 140-foot length of existing dirt road located east of the concrete rubble area will be raised as indicated on the drawings (see Sheet C5), using approved excavated borrow materials placed in maximum twelve-inch thick lifts. Each lift of placed roadway

materials will be leveled and then compacted with at least 2 passes of a steel-wheel roller. Temporary access roads and/or improvements to the remainder of the existing 'road' network will be constructed as deemed necessary by the Contractor to properly perform the required work. The Contractor is required to restore the network upon completion to a condition that is at least equivalent to existing.

#### **4.11 Fence Repair**

The Contractor will inspect the entire perimeter fence and make repairs to restore the fence to its original condition. Repairs may include:

- Replace bent posts;
- Replace missing or broken barb-wire strands;
- Tighten excessively loose strands (strands that may be displaced more than approximately six inches from straight position)
- Replace missing, damaged, or un-legible site boundary signs.

#### **4.12 Re-vegetation**

All locations where soil has been excavated or placed will be re-seeded. The local Range Manager with the Natural Resource Conservation Service was consulted to develop the seed mix and the application requirements. The seed mix will include:

- Crested Wheat (3 strains, Norton, high crest, Siberian; 3 lb./acre each)
- Yellow Sweet Clover (1 lb./acre)
- Russian Wild Rye (2 lb./acre)
- Pubescent Wheatgrass (3 lb./acre)
- Forage Kochia (1/2 lb./acre)

At the borrow areas, the stockpiled surface material from the clearing/grubbing operation may be spread to function as seed material.

Two inches of topsoil, obtained from off-Depot, will be spread over all areas to be seeded. The supplier of the topsoil must provide written assurance that the soil is native material, has not been previously used, and is free from debris. The seed mix will be applied with standard agricultural spreading equipment in late fall or early winter. The seed mix shall be obtained and planted shortly after harvest of the Forage Kochia seed, which is typically

harvested in late fall and has a short “shelf life”. The seeded areas will be watered twice during the following summer.

#### **4.13 Surveying**

Upon completion of the remedial actions at this site contractor shall provide topographic information of the site where borrow was excavated and where areas were filled with debris and soil. Topographic data will consist of finish grade spot elevations on a 50 foot grid and one-foot contour lines within mapped boundaries of both borrow areas used and areas filled. Contractor shall establish local benchmarks based on sewer manhole cover elevations provided. Benchmarks will be used by contractor to establish finish grade to the nearest 1/10<sup>th</sup> of 1 foot of all borrow excavations and fill areas. Contractor will be provided with an electronic copy of the topographic survey map. This map will be used as a base map of existing conditions and finish grade data shall be drawn on this map and submitted electronically in AUTOCAD 2004 format.

#### **4.14 Inspection and Maintenance**

Following site construction activities, an inspection and maintenance program will be initiated. This program is described in Attachment 5. The tasks of that program will be performed by Army personnel or Contractors.

## 5.0 REFERENCES

- Dames & Moore, 2000. *Final Planning Documents, Known Releases SWMUs*, Tooele Army Depot. February.
- Kleinfelder, October 2004. *Semi-Annual Groundwater Quality Report and Voluntary SWMU Sampling, Spring 2004*.
- Natural Resource Conservation Service – USDA, *Personal communication with Norman Evenstad*, November 2004, and Brock Benson, March 2005.
- MWH, 2002. *Final, Exploration Trenching Report for SWMU 12/15, Sanitary Landfill/Pesticide Disposal Area*, Tooele Army Depot, January.
- Rust Environment and Infrastructure, 1995. *Revised Final Phase II RCRA Facility Investigation Report for Known Releases SWMUs, Tooele Army Depot- North Area*, April
- Tooele Army Depot, 1997, *Solid and Hazardous Waste Management Plan (SHWMP)*. March.
- URS, 2003. *Final Corrective Measures Study Report for SWMU 12/15 – Sanitary Landfill/Pesticide Disposal Area*, Tooele Army Depot, March.
- U.S. Army Corps of Engineers, Engineer Manual EM 385-1-1, 1996. *Safety and Occupational Health Document Requirements for Hazardous, Toxic and Radioactive Waste (HTRW) Activities*. September.
- U.S. Army Corps of Engineers, *Engineer Manual EM 1110-1-1005*, 1994. *Topographic Surveying*, August.
- U.S. Army Corps of Engineers, Engineer Manual ER 385-1-92, 1994. *Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) and Ordnance and Explosive Waste (OEW) Activities*. March.
- U.S. Soil Conservation Service (USSCS), U.S. Department of Agriculture, Unpublished Data, 1991. *Soil Survey of Tooele County Area, Utah*.

# ATTACHMENT 1

## SITE PLANS / DRAWINGS



**US Army Corps  
of Engineers**  
**Sacramento District**

# **SWMU 12/15 LANDFILL CORRECTIVE MEASURES**

## **TOOELE ARMY DEPOT UTAH**

Drawing Code:  
Final

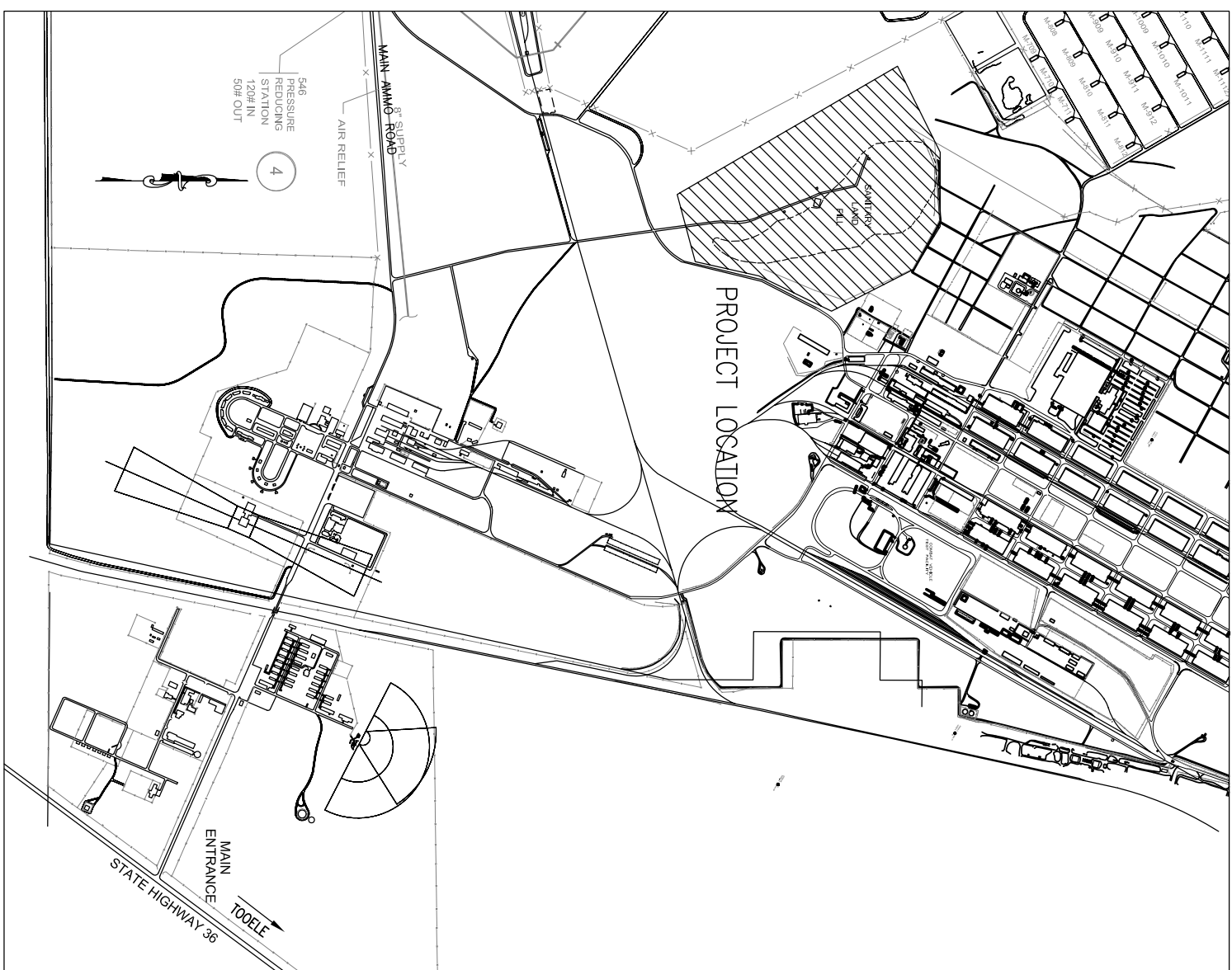
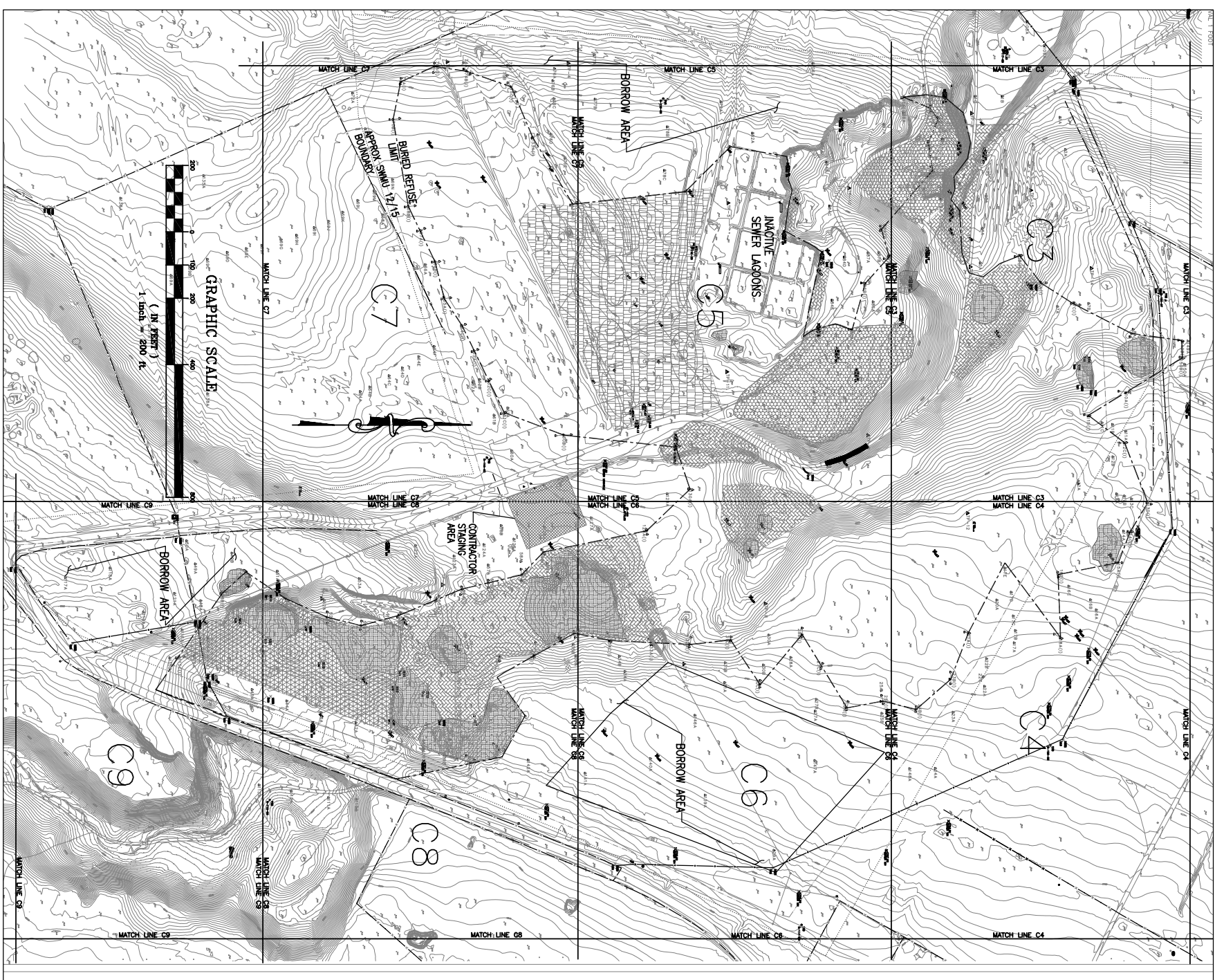
Prepared by:  
SACRAMENTO DISTRICT  
DESIGN BRANCH

TITLE SHEET

Sheet  
reference  
number:  
**G1.0**  
Sheet 1







MATCH LINE C7  
MATCH LINE C8

CONTRACTOR STAGING  
AREA

OLD LANDFILL  
OFFICE BUILDING

MATCH LINE C6  
MATCH LINE C8

MATCH LINE C8

GRAPHIC SCALE

( IN FEET )

1 inch = 50 ft.

MATCH LINE C8  
MATCH LINE C9

Sheet  
reference  
number:  
C8

SITE PLAN

DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS  
SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT  
IN-HOUSE DESIGN  
1325 'J' STREET  
SACRAMENTO, CA 95814-2922

Designed by:  
E. GABELE

Dwn by:  
EG

Reviewed by:

Submitted by:

Chief, Civil Eng. Des. Sec. A

Date:  
XX JAN 2005

Design file no:

Drawing Code:  
FINAL

File name:  
Plot date:  
Dwg scale: AS\_NOTED

Symbol

Description

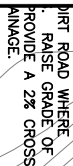
Date

Approved

US Army Corps  
of Engineers  
Sacramento District

UPDATE





# SURFACE DEBRIS

DEBRIS PILES SHALL BE COVERED WITH  
2.0' MINIMUM SOIL COVER.

~~MATCH LINE C5~~  
~~MATCH LINE C6~~

**BURIED REFUSE**  
**LIMIT**

MATCH LINE C4

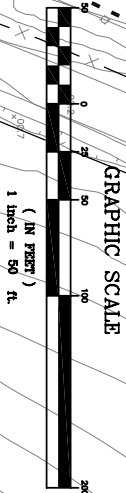
~~MATCH LINE C6~~

~~BORROW AREA  
APPROX 8 ACRES  
MAXIMUM DEPTH OF CUT 1.59'  
IN BORROW ARE IS 3.5'  
FEET~~

~~FINISH GRADE CONTOURS~~

MAXIMUM CUT SLOPE OF  
6 HORIZONTAL TO 1  
VERTICAL

MATCH LINE C6



## GRAPHIC SCALE

GROUND  
SWMU 12/15 LANDFILL  
CORRECTIVE MEASURES

## SITE PLAN

DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS  
SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT  
IN-HOUSE DESIGN  
1325 'J' STREET  
SACRAMENTO, CA 95814-2922

Designed by: E. GABELE
Dwn by: EG

Dwn by: EG	Spec No.:
---------------	-----------

Reviewed by:

Submitted by:

Chief, Civil Eng. Des. Sec. A

Date:  
XX JAN 2005

XX JAN 2005

Design file no:

Drawing Code:  
FINAL

File name:  
Plot date:  
Dwg scale: AS\_NOTED

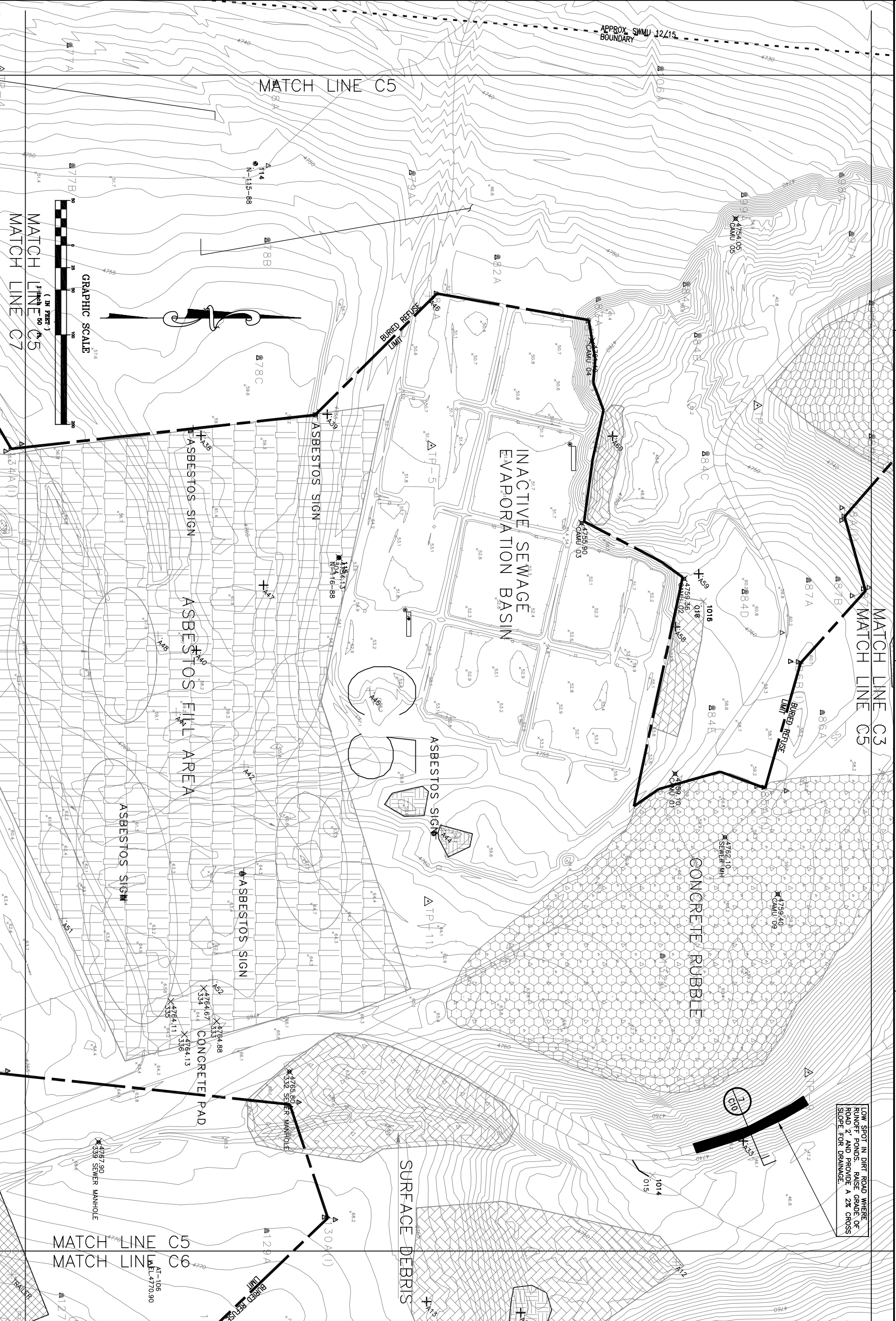
[illegible]

**US Army Corps  
of Engineers  
Sacramento Dis**

**US Army Corps  
of Engineers  
Sacramento District**

Sheet  
reference  
number:  
C6

## UPDATE



LOW SPOT IN DIRT ROAD WHERE  
RUNOFF PONDS. RAISE GRADE OF  
ROAD 2' AND PROVIDE A 2% CROSS  
SLOPE FOR DRAINAGE.

MATCH LINE C5  
MATCH LINE C6

AT-106  
L&E 4770.90

SITE PLAN

TOOELE PROVING GROUND  
SWMU 12/15 LANDFILL  
CORRECTIVE MEASURES

UTAH

DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS  
SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT  
IN-HOUSE DESIGN  
1325 'J' STREET  
SACRAMENTO, CA 95814-2922

Designed by:  
E. GABELE

Dwn by:  
EG

Reviewed by:

Submitted by:  
Chief, Civil Eng. Des. Sec. A

Spec No.:

Date:  
XX JAN 2005

Design file no:

Drawing Code:  
FINAL

File name:  
Plot date:  
Dwg scale: AS\_NOTED

Rev.

Symbol

Description

Date

Approved

US Army Corps  
of Engineers  
Sacramento District



Sheet  
reference  
number:  
C5

UPDATE

## SITE PLAN

Approved

**Sacramento District**

C4

## UPDATE





LOW SPOT IN DIRT ROAD WHERE  
RUNOFF PONDS. RAISE GRADE OF  
ROAD 2' AND PROVIDE A 2% CROSS  
SLOPE FOR DRAINAGE.

## GRAPHIC SCALE

**1 inch = 50 ft.**

UND  
U 12/15 LANDFILL  
RECTIVE MEASURES

Sheet  
reference  
number:  
C3

UPDATE

DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS  
SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT  
IN-HOUSE DESIGN  
1325 'J' STREET  
SACRAMENTO, CA 95814-2922

Designed by:	E. GABELE
Dwn by:	EG

Dwn by:  
EG

Reviewed by:

Submitted by  
Chief, Civil Eng.

Date:  
XX JAN 2005

XX JAN 2005

Design file n

Drawing Code  
FINAL

File name:  
Plot date:  
Dwg scale:

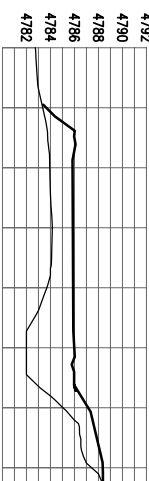
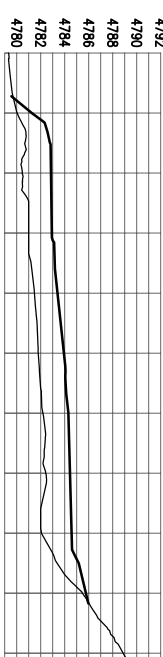
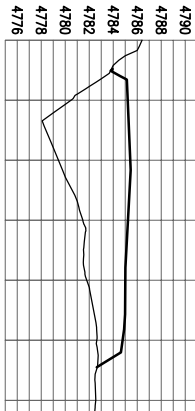
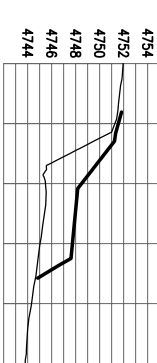
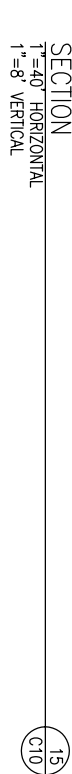
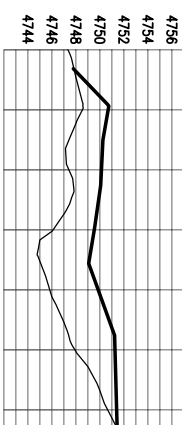
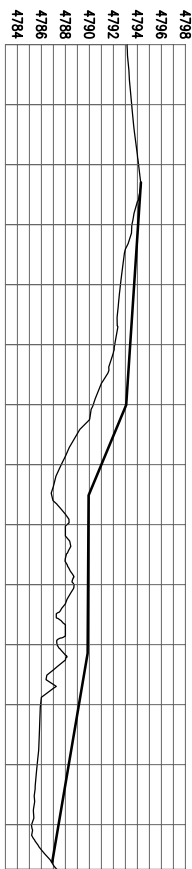
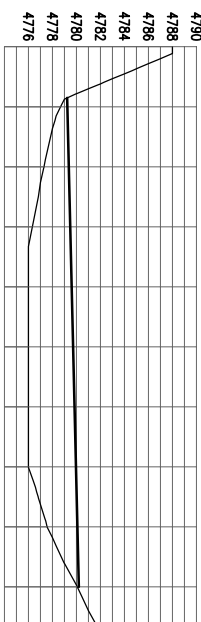
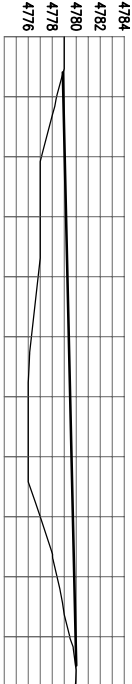
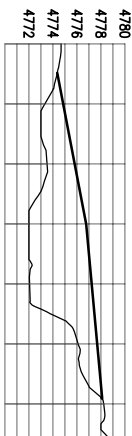
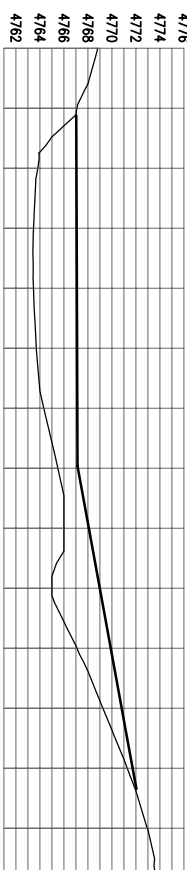
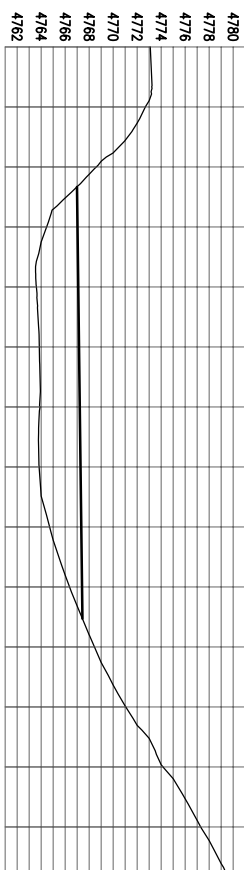
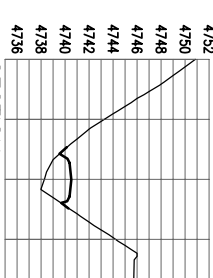
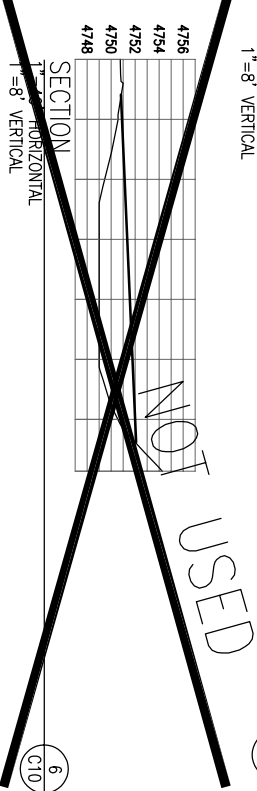
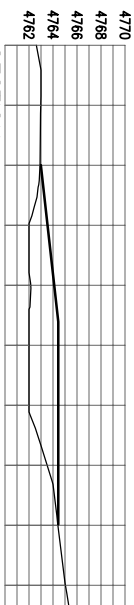
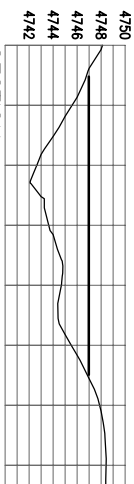
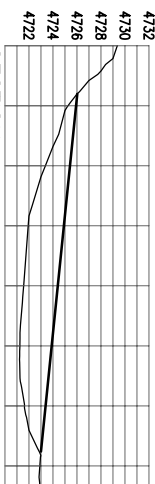
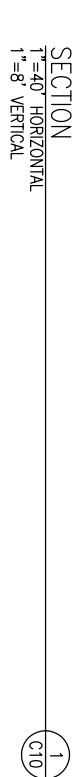
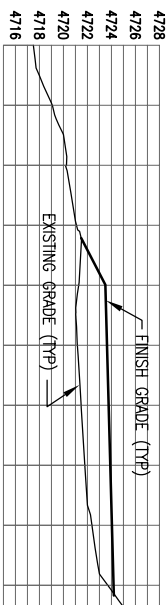
Symbol	Description	Date      Approved

**US Army Corps  
of Engineers  
Sacramento District**







[illegible]

Designed by: E. GABELE		Date: XX JAN 2005	Rev.
Dwn by: EG	Spec No.:	Design file no:	
Reviewed by:		Drawing Code: FINAL	
Submitted by:		File name:	
Chief, Civil Eng. Des. Sec. A		Plot date:	
		Dwg scale: AS_NOTED	

DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS  
SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT  
IN-HOUSE DESIGN  
1325 'J' STREET  
SACRAMENTO, CA 95814-2922

UTAH

GROUND  
SWMU 12/15 LANDFILL  
CORRECTIVE MEASURES

## SECTIONS

Sheet  
reference  
number:  
C10

UPDATE

# **ATTACHMENT 2**

## **HEALTH AND SAFETY DESIGN ANALYSIS**

## HEALTH AND SAFETY DESIGN ANALYSIS

### SWMU 12/15 - Sanitary Waste landfill and Pesticide Disposal Area Tooele Army Depot Tooele, Utah

1	Accident Prevention Plan (APP).....	2
1.1	Elements of Accident Prevention Plan .....	3
1.2	Activity Hazard Analyses .....	4
1.3	Display of Safety Information .....	4
1.4	Safety and Health Program (SHP) .....	4
1.5	Site Safety and Health Plan (SSHP) Appendix to the APP .....	5
1.6	Health and Safety Design Analysis (HSDA) .....	5
1.7	References .....	6
1.8	Deviations from SSHP .....	6
2	Site Safety and Health Plan Elements.....	6
2.1	Site Description and Contamination Characterization.....	6
2.2	SWMU 12/15 Sanitary Landfill.....	7
2.3	Hazard/Risk Analysis.....	7
2.4	Staff Organization, Qualifications, and Responsibilities .....	9
2.5	Training.....	10
2.6	Personal Protective Equipment .....	11
2.7	Medical Surveillance .....	12
2.8	Exposure Monitoring/Air Sampling Program.....	14
2.9	Standard Operating Safety Procedures, Engineering Controls, and Work Practices....	15
2.10	Site Control Measures.....	15
2.11	Site Security .....	17
2.12	Personal and Equipment Decontamination .....	18
2.13	Emergency Response Plan and Equipment.....	20
2.14	Accident Prevention.....	21
2.15	Logs, Reports, and Recordkeeping .....	21

#### 1 **Accident Prevention Plan (APP)**

The Contractor shall use a qualified Safety and Health Manager (SHM) to prepare the written site-specific APP in accordance with the format and requirements of USACE EM 385-1-1 and as supplemented herein. Cover all paragraph and subparagraph elements in USACE EM 385-1-1, Appendix A, "Minimum Basic Outline for Preparation of Accident Prevention Plan". The APP shall include Activity Hazard Analyses (AHAs) with a Site Safety and Health Plan (SSHP) appendix for the Hazardous, Toxic, and Radioactive Waste (HTRW) site Operations. Where a paragraph or subparagraph element is not applicable to the work to be performed indicate "Not Applicable" next to the heading. Specific requirements for some of the APP elements are described below. The APP shall be job-specific and shall address any unusual or unique aspects of the project or activity for which it is written. The APP shall interface with the Contractor's

overall safety and health program (SHP). Any portions of the Contractor's overall safety and health program referenced in the APP shall be included in the applicable APP element and made site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The Contractor, SHM, on-site superintendent, and SSHO shall sign the APP.

#### 1.1 Elements of Accident Prevention Plan

The following elements of Appendix A of EM 385-1-1 shall be addressed in the APP:

- a. Signature sheet
- b. Background information
- c. Statement of safety and health policy
- d. Responsibilities and lines of authorities
- e. Subcontractors and suppliers
- f. Training
- g. Safety and health inspections
- h. Safety and health expectations, incentive programs and compliance
- i. Accident reporting
- j. Medical support
- k. Personal protective equipment
- l. Plans (programs, procedures) required by the safety manual
- m. Contractor information
- n. Site-specific hazards and controls

In addition to the above elements, the following is required when applicable:

- a. Health Hazard Control Program. The contractor shall designate a competent and qualified person to establish and oversee a Health Hazard Control Program in accordance with Section 6 of EM 385-1-1. The program shall ensure that employees, on-site Government representatives, and others, are not adversely exposed to chemical, physical and biological agents and that necessary controls and protective actions are instituted to ensure health.
- b. Drug Prevention Program. Conduct a proactive drug and alcohol use prevention program for all workers, prime and subcontractor, on the site. Ensure that no employee uses illegal drugs or consumes alcohol during work hours. Ensure there are no employees under the influence of drugs or alcohol during work hours. After accidents, collect blood, urine, or saliva specimens and test the injured and involved employees for the influence of drugs and alcohol. A copy of the test shall be made available to the Contracting Officer (CO) upon request.
- c. Training Records and Requirements. List of mandatory training and certifications which are applicable to the project (e.g., explosive actuated tools, confined space entry, fall protection, crane operations, vehicle operator, forklifts operators, personal protective equipment); list of requirements for periodic retraining/certification; outline requirements for supervisory and employee safety meetings.

- d. Hazard Communication Program. A hazard communication program shall be established and implemented in accordance with 29 CFR 1910.1200/29 CFR 1926.59. Material safety data sheets (MSDS) shall be provided for all hazardous materials brought to the worksite.

#### 1.2 Activity Hazard Analyses

The contractor shall develop an AHA for every operation involving site activities presenting hazards not experienced in previous project operations or where a new work crew or subcontractor will perform work. The AHAs format shall be in accordance with Figure 1-2 of EM 385-1-1. Subsequent AHAs shall be submitted as amendments to the APP. The analysis must identify and evaluate hazards and outline the proposed methods and techniques for the safe completion of each phase of work. At a minimum, define activity being performed, sequence of work, specific safety and health hazards anticipated, control measures (to include personal protective equipment) to eliminate or reduce each hazard to acceptable levels, equipment to be used, inspection requirements, training requirements for all involved, and the competent person in charge of that phase of work.

#### 1.3 Display of Safety Information

The following information shall be displayed on the safety bulletin board:

- a. Map denoting the route to the nearest emergency care facility
- b. Emergency phone numbers
- c. Copy of the most up-to-date APP and appendices
- d. AHA(s)
- e. OSHA 300A Form
- f. Applicable permits
- g. A sign indicating the number of hours worked since last lost workday accident
- h. OSHA Safety and Health Protection-On-The-Job Poster
- i. Safety and Health Warning Posters

#### 1.4 Safety and Health Program (SHP)

The contractor is required by regulation to develop and maintain a written SHP (29 CFR 1920.120(b)/29 CFR 1926.65(b)). The contractor shall have this program available for review if requested by the Contracting Officer (CO). General occupational safety and health program, plans, and standard operating procedures (SOPs) may include, but not limited to the following:

- a. Medical surveillance program
- b. Rules regarding access to employee exposure and medical records
- c. Employee emergency plans and fire prevention plans
- d. Respiratory protection program
- e. Personal protection equipment program
- f. Hazard communication program
- g. Lockout-tagout program
- h. Excavation and trenching procedures
- i. Hot work permits
- j. Blood borne pathogens exposure control plan
- k. Hearing conservation program
- l. Heat/cold stress program
- m. Permit-required confined space program

- n. Emergency response plan
- o. Decontamination procedures
- p. Spill containment program
- q. Munitions and Explosives of Concern (MEC) avoidance
- r. Drum/container handling procedures
- s. Guarding of machinery and equipment program
- t. Fall protection procedures
- u. Illumination
- v. Sanitation
- w. Process safety management program
- x. Air monitoring program (personal, area, ambient air)
- y. Alcohol and drug abuse program

#### 1.5 Site Safety and Health Plan (SSHP) Appendix to the APP

The Contractor shall develop and implement a SSHP that shall be attached to the APP as an appendix. The SSHP shall address all occupational safety and health hazards (traditional construction as well as contaminant related hazards) associated with HTRW activities. The SSHP shall cover each SSHP element in Appendix C of ER 385-1-92. There are overlapping elements in Appendix C of ER 385-1-92 and Appendix A of EM 385-1-1. SSHP appendix elements that overlap with APP elements need not be duplicated in the SSHP, provided each safety and occupational health issue is adequately documented in the APP. The SSHP shall be developed under the direct supervision of a qualified SHM. A qualified Site Safety and Health Officer (SSHO) shall implement and enforce the APP/SSHP. The SSHP shall be designed to identify, evaluate, and control safety, health, biological, and radiological hazards, and provide for emergency response. The SSHP shall comply with all Federal, state, regional and local health and safety requirements. Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution. Some requirements of this appendix are not intended to dictate site operations and procedures for safety and health, but to specify what information pertaining to the contractor's safety and health program is required to be presented in the submittal. Daily safety and health inspections shall be conducted to determine if site operations are conducted in accordance with the approved APP/SSHP, OSHA, USACE, and contract requirements.

Safety and occupational health requirements for military munitions (MM), explosive media or chemical agent contaminated media (CACM) are covered in ER 385-1-95. HTRW projects with potential for containing MM, explosive media and CACM shall incorporate the additional requirements specified by ER 385-1-95. Projects involving explosive media which are contaminated with explosives but do not present an explosion hazard are covered by the requirements of ER 385-1-92.

#### 1.6 Health and Safety Design Analysis (HSDA)

This Health and Safety Design Analysis (HSDA) is used as the basis for developing Site-Specific Safety and Health Plans for work at hazardous, toxic, and radioactive waste (HTRW) sites. Specifically, it provides the rationale and decision logic for the information to be addressed in the contractor's SSHP. The SSHP shall address the safety and health hazards and controls unique to vegetation removal/site preparation, removal/consolidation of surface debris, excavation/earth

moving/placing cover material, re-vegetation, providing unexploded ordnance (UXO) support during construction activities, and fence repair. The resulting contractor's SSHP will be reviewed and approved by the USACE, Sacramento District's (CESPK) Contracting Officer (CO) prior to initiation of site field activities.

### 1.7 References

The contractor's SSHP and subsequent activities must comply with the following referenced documents, at a minimum:

- a. Title 29, Code of Federal Regulations (CFR) 1910, *Occupational Safety and Health Standards*.
- b. 29 CFR 1926, *Safety and Health Regulations for Construction*.
- c. Title 29, Code of Federal Regulations (CFR) 29 CFR 1926.65/29 CFR 1910.120), *Hazardous Waste Operations and Emergency Response*.
- d. U.S. Army Corps of Engineers (USACE), *Safety and Health Requirements Manual*, EM 385-1-1 (3 November 2003).
- e. USACE, *Safety and Occupational Health Document Requirements for Hazardous, Toxic and Radioactive Waste (HTRW) Activities*, ER 385-1-92 (1 July 2003).
- f. USACE, *Data Item Description MR-005-06, Accident Prevention Plan* (1 December 2003).
- g. USACE, Engineer Pamphlet EP 75-1-2, *Munitions and Explosives of Concern (MEC) During HTRW, and Construction Activity*.
- h. USACE, Engineer Pamphlet EP 385-1-95a, *Basic Safety Concepts and Considerations for Munitions and Explosives of Concern (MEC) Response Action Operations*.
- i. USACE, Engineer Regulation ER 1110-1-8153, *Ordnance and Explosives Response* (14 May 1999).
- j. NIOSH/OSHA/USCG/EPA, *Occupational Safety and Health Guidance Manual for Hazardous Waste Activities* (October 1985).

Ordnance and Explosives documents and Data Item Descriptions are available from the Ordnance and Explosives Mandatory Center of Expertise (OE-MCX)  
<http://www.hnd.usace.army.mil/oew/>

USACE Engineer Regulations (ER) and Engineer Manuals (EM) are available from the Headquarters, USACE Publications website <http://www.usace.army.mil/inet/usace-docs/>

### 1.8 Deviations from SSHP

No deviations from the contractor's SSHP may be implemented without the prior notification and approval of the contractor's SHM and the CO, except in case of an emergency. Changes in working conditions may necessitate modifications to the SSHP.

## 2 Site Safety and Health Plan Elements

### 2.1 Site Description and Contamination Characterization

Tooele Army Depot (TEAD) is located in the Tooele Valley in Tooele County, UT, directly west of the city of Tooele and approximately 35 miles southwest of Salt Lake City. TEAD occupies

an area of approximately 23,610 acres. TEAD is an active military facility that was established in 1942 for servicing, rebuilding, and storing all forms of wheeled vehicles for the Army. TEAD's current mission is the storage, maintenance, and demolition of Conventional weapons and ammunition. The site is located on an active portion of the installation.

## 2.2 SWMU 12/15 Sanitary Landfill

SWMU 12/15 is located at the southern end of an open revetment area and is approximately 150 acres in size. A former arroyo separates two disposal areas within SWMU 12/15. SWMU 12/15 began operations in 1942 and has received both hazardous and non-hazardous wastes. In 1980, a Waste Management Plan was issued for TEAD that did not allow further disposal of hazardous wastes at SWMU 12/15. SWMU 12/15 continued to receive construction debris until November 1995. Test pit records from areas of suspected landfill activity indicate the presence of buried solid industrial and municipal waste throughout the site. Batter acid containers, insecticide and herbicide containers, asbestos-containing materials, an ethylene glycol were also reportedly disposed of at SWMU 12/15. The most commonly identified debris is wood, metal fragments, and concrete, with fewer occurrences of cinder blocks, asphalt, sheet metal, broken glass, pop cans, and foam.

## 2.3 Hazard/Risk Analysis

The contractor's SSHP shall be designed to reduce risks associated with chemical, physical, and biological hazards encountered during the soil removal and potholing activity.

### 2.3.1 Safety Hazards

Safety hazards associated with the work tasks include exposure to: weather, heat/cold stress, fires, open excavations, pressure washing (if needed), heavy equipment operation, struck-by and caught between hazards with moving equipment and machinery, sharp edges associated with debris removal, buried and overhead utilities, electrical connection (if needed), heavy lifting, slip, trip, falls on same surface, motor vehicles moving about the site, and exposure to Munitions and Explosives of Concern (MEC). The contractor shall ensure that the controls implemented to address these safety hazards comply with applicable sections of EM 385-1-1 and ER 385-1-92. In addition, excavation side-wall stability shall be addressed when depths exceed 5 feet. Side-wall stability shall be obtained by shoring, or more likely side-sloping or stair-stepping.

### 2.3.2 Chemical Hazards

Asbestos, pesticides heavy metals, and polycyclic aromatic hydrocarbons (PAHs) are chemicals of potential concern (COPCs). The vadose zone soil (at depths ranging from 150 to 300 feet below ground surface) has elevated levels of trichloroethylene (TCE). The routes of exposure that can be anticipated are inhalation of dry contaminated soil and vapors, direct skin contact with contaminated soil, and incidental ingestion of airborne contaminated soil.

### 2.3.3 Established Exposure Values

The toxic hazards to site personnel associated with the COPCs can be assessed through comparison of actual exposures with several established occupational exposure limits:

- a. Permissible Exposure Limits (PELs) established by the Federal Occupational Safety and Health Administration (OSHA).



- b. Recommended Exposure Limits (RELs) established by the National Institute for Occupational Safety and Health (NIOSH).
- c. Threshold Limit Values/Time Weighted Averages (TLV/TWAs) established by the American Conference of Governmental Industrial Hygienists (ACGIH®).
- d. Immediately Dangerous to Life or Health (IDLH) values established NIOSH.

#### 2.3.4 Material Safety Data Sheets

The contractor shall include Material Safety Data Sheets (MSDSs) for each known or anticipated chemical brought to the site in support of the corrective measures work.

#### 2.3.5 Physical Hazards

Physical hazards that can be anticipated for this project include: MEC, noise from operating equipment, fire from flammable material, excavation hazards, faulty electrical connections, and heat or cold stress. The contractor's SSHP shall evaluate controls that can be implemented to lower the noise exposure during equipment operation as well as control for temperature extremes.

#### 2.3.6 Radiological Hazards

None of the site history or background indicates that ionizing radiation is a threat to site personnel. If the contractor plans to utilize nuclear sourced equipment (i.e., soil compaction nuclear density gauge) then the radiological hazards associated with this equipment shall be addressed in the contractor's SSHP.

#### 2.3.7 Biological Hazards

Snakes and insects are found throughout the area. Possible cover and habitat for these shall be minimized in the field operations area. Hantavirus and West Nile Virus exposure is also a potential hazard. The contractor's SSHP shall address personnel awareness of the potential biological risks and provide guidance for controlling the hazards.

#### 2.3.8 MEC Hazards

No documentation indicates that explosives were disposed of in the landfill. However, because these materials were used at TEAD, vigilance and caution must be exercised. Hazards from MEC are the potential for fragmentation, thermal burns, concussions, and chemical exposure that would result from an unintentional detonation. Anomaly avoidance will be implemented. Any time munitions with unknown fillers are encountered, all work will immediately cease. Project personnel will withdraw along cleared paths upwind from the discovery. A team consisting of a minimum of two personnel will secure the area as far upwind as possible while still maintaining security of the area. Notify the CO if MEC is encountered. The government is responsible for evaluation and disposal of the MEC.

#### 2.3.9 Action for Mitigating Site Hazards.

The contractor's SSHP shall address specific means of controlling and mitigating the safety, chemical, physical, biological and MEC hazards identified above. Specifically, action shall be addressed for the following:

- a. Implementation of engineering controls, air-conditioned cabs on heavy equipment, dust suppression, and limiting the number of people allowed in the work zone.

- b. Upgrading and downgrading levels of personal protective equipment based on personal air monitoring or dust monitoring. Based on sampling results and site history, it appears that Level D PPE will suffice for site activities. The contractor shall select PPE based on real-time and integrated air monitoring and the risk evaluation.
- c. Stopping work or evacuating the site based on air monitoring or a physical catastrophe such as fire.
- d. Preventing exposure of the public and non-workers to the site through access control.
- e. Distance restrictions for operation of equipment near overhead power lines shall be established based on OSHA requirements.
- f. Implement levels for heat and cold stress monitoring.

#### 2.3.10 Hazard Communication Program

Because of the various hazards and potential hazards, the contractor shall include a hazard communication program in the SSHP for this project. Details regarding this program are found in 29 CFR 1910.1200/29 CFR 1926.59.

#### 2.4 Staff Organization, Qualifications, and Responsibilities

Implementation of the contractor's SSHP should be accomplished through an integrated effort of the following contractor personnel: project manager, SHM (certified industrial hygienist [CIH] or (certified safety professional) [CSP]), site safety and health officer (SSHO), UXO staff, and trained workforce. Additionally, the services of a board-eligible occupational health physician shall be identified. The contractor's SSHP shall indicate the lines of authority and responsibilities for each identified person. It shall also include the mechanism employed for coordinating and controlling the work activities of subcontractors and suppliers. At least two people at the site must be trained in first aid and cardiopulmonary resuscitation (CPR).

##### 2.4.1 General

All personnel (including subcontractor personnel) who excavate, handle, sample, or dispose of, or who otherwise have a potential for exposure to contaminated materials shall be subject to the SSHP developed by the contractor. All project personnel will be responsible for continuously adhering to the safety procedures in the SSHP while performing project activities. In no case may work be performed in a manner that conflicts with the intent of or the inherent safety and environmental cautions expressed in this HSDA.

##### 2.4.2 Project Manager

The contractor shall designate a Project Manager (PM) who has overall responsibility for project oversight. The PM will interact with regulatory agency personnel to ensure proper implementation of the SSHP. The PM shall also be responsible for managing field activities, subcontracts, providing necessary resources and guidance to the project team, and maintaining consistency in procedures and work practices.

##### 2.4.3 Safety and Health Manager

The designated SHM shall be a Certified Industrial Hygienist (CIH) or a Certified Safety Professional (CSP) and have overall responsibility for project safety and health. The SHM's responsibilities are to provide technical guidance to the PM, field team, and SSHO to ensure that

all requirements of the SSHP are followed. If warranted, the SHM shall conduct site safety audits during field activities to ensure that the SSHP is being implemented.

#### 2.4.4 Field Superintendent

The designated Field Superintendent shall be responsible for all site operations, including those of subcontractors. The Field Superintendent shall be responsible for ensuring that all procedures and QA/QC provisions are adhered to in the field and that field equipment is properly calibrated and maintained and that records are kept of such. The Field Superintendent is the liaison with TEAD and local agencies and will notify both parties in the event of a hazardous materials release to the environment.

#### 2.4.5 Site Safety and Health Officer

The SSHO shall be directly responsible to the SHM and shall have the specific training, knowledge, and experience necessary to implement the SSHP and verify compliance with applicable safety and health requirements. The SSHO shall have the primary responsibility of implementing the SSHP, which includes ensuring personnel health and safety, reviewing subcontractor health and safety practices, correcting improper conditions, and following accepted safety practices. In addition, the SSHO is responsible for coordinating air monitoring, as applicable. Unless an emergency is involved, the SSHO shall notify the PM, and project safety and health manager prior to modifying any safety procedures detailed in the SSHP.

#### 2.5 Training

The Contractor shall include in the SSHP an employee training program complying with, but not necessarily limited to, those requirements specified and approved by the Corps of Engineers in EM 385-1-1, ER 385-1- 92, and in OSHA 29 CFR 1910.120/29 CFR 1926.65, and 29 CFR 1910.1200/29 CFR 1926.59. This includes training on hazardous waste operations, activity hazard analysis, PPE use, heavy equipment operation, hazard communication, OE, asbestos, and annual follow-up training. While 20 CFR 1910.120/29 CFR 1926.65 provides for varying levels of training based on job function, the USACE policy is to require the following:

- a. A minimum of 40 hours of hazardous waste operations and emergency response (HAZWOPER) training offsite.
- b. Three days or 24 hours of actual field experience under the direction of a trained supervisor.
- c. 8 hours of HAZWOPER refresher training, annually.
- d. Onsite supervisors shall have an additional 8 hours of training covering the contractor's safety and health program, personal protective equipment program, spill containment, and health and hazard monitoring.
- e. Pre-entry briefing covering the contractor's SSHP; this will include training on chemical, biological, radiological, physical, and OE hazards.
- f. At least two persons currently certified in First Aid/Cardiopulmonary Resuscitation American Red Cross or equivalent agency shall be present onsite at all times during site operations.
- g. Hazard Communication (29 CFR 1910.120/29 CFR 1926.59).
- h. MEC awareness.
- i. Asbestos awareness (29 CFR 1926.1101)

## 2.6 Personal Protective Equipment

### 2.6.1 General

The contractor shall provide all contractor personnel with appropriate personal safety equipment and protective clothing, and shall ensure safety equipment and protective clothing is clean and well maintained. Based on the assessment, it is anticipated that activities can be accomplished in Level D PPE. However, the contractor must verify this assessment and allow for upgrading/downgrading PPE based on actual site conditions.

### 2.6.2 Level D PPE

### 2.6.3 Conditions for Level D

Level D protection shall be used under the following conditions:

- a. The atmosphere contains no known hazard above individual or combined PELs, essentially nuisance contamination only.
- b. Concentrations of airborne toxic compounds do not exceed normal background concentrations or specified action levels requiring use of respiratory protective equipment.
- c. The atmosphere contains at least 19.5 percent oxygen.
- d. Work functions preclude splashes, immersion in, unexpected inhalation of, or direct contact with hazardous concentrations of harmful chemicals.

### 2.6.4 Level D Ensemble

Level D protective equipment shall consist of the following, unless otherwise stated in the contractor's SSHP:

- a. Dedicated work clothing consisting of long pants and sleeved shirts. These may include standard breathable Tyvek<sup>®</sup> coveralls, or standard cotton work uniforms.
- b. Safety shoes or boots meeting the specifications of American National Standards Institute (ANSI) Z41.
- c. Gloves; impervious gloves are required during site activities that could result in direct contact with potentially contaminated soil, water, or other items.
- d. Safety glasses, goggles, face shield, or other approved eye protection. All approved eye protection must meet the specifications of ANSI Z87.1. The use of contact lenses is discouraged during Level D operations, but not prohibited. Rather, safety glasses or goggles which fit over prescription lenses or prescription glasses or goggles are recommended.
- e. Hard hat, unless specifically stated otherwise; all approved hard hats must meet the specifications of ANZI Z89.1.
- f. Hearing protection (muffs or plugs) as necessary, depending on measured decibel readings in the field. The protective device must have a noise reduction rating capable of providing the wearer with enough protection so as to reduce the received noise level to below 85 dBA.
- g. Reflective traffic vests.

Because of recent concerns about hantavirus, which has resulted in several deaths in the Southwestern part of the United States, respirators may be worn by site personnel in Level D

ensembles. For this reason, air-purifying respirators (APR), half-faced or full-faced, with a high efficiency particulate air (HEPA) filter (N-, R-, P-100), shall be made available. The P100 filter will suffice, as the hantavirus is typically transported via dust particles.

#### 2.6.5 Level C PPE

#### 2.6.6 Conditions for Level C

Although not anticipated, Level C protection shall be used under the following conditions:

- a. Concentration of known airborne compounds or dust in the breathing zone is above the action levels given in the contractor's SSHP for individual work tasks.
- b. The types of air contaminants have been identified, concentrations measured, and an APR and chemically protective clothing are available that can protect against the identified contaminants.
- c. The substance(s) has adequate warning properties and the criteria for the use of an APR have been met.
- d. The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect any exposed skin.
- e. The atmosphere contains at least 19.5 percent oxygen.

#### 2.6.7 Other

Levels B and A PPE are not anticipated for this project. The contractor's SSHP, however, must address the contractor's assessment level of PPE needed to complete the work safely.

### 2.7 Medical Surveillance

#### 2.7.1 Written Program

The contractor shall write and include in the SSHP a medical surveillance program (29 CFR 1910.120/29 CFR 1926.65) that includes scheduling of examinations, certification of fitness, compliance with OSHA requirements for hazardous waste operations, respiratory protective equipment use, and information provided to the physician.

#### 2.7.2 Occupational Physician

The contractor shall employ the services of a board-certified or board-eligible occupational health physician to determine the minimum content and frequency of examinations for their personnel. The determination shall be based on probable site conditions and tasks, exposure to the COPCs, and the use of protective equipment. The occupational health physician shall certify employees' fitness for duty. A copy of each employee's certification shall be included as an appendix to the contractor's SSHP.

#### 2.7.3 Emergency Medical Assistance

Prior to work start-up, the contractor shall establish an emergency medical assistance network. The Fire Department, ambulance service, and clinic or hospital emergency facility should be identified and phone numbers for these services posted in a conspicuous place at the project site. A map and directions indicating the fastest route to the hospital emergency room shall be posted. The hospital information is given below.

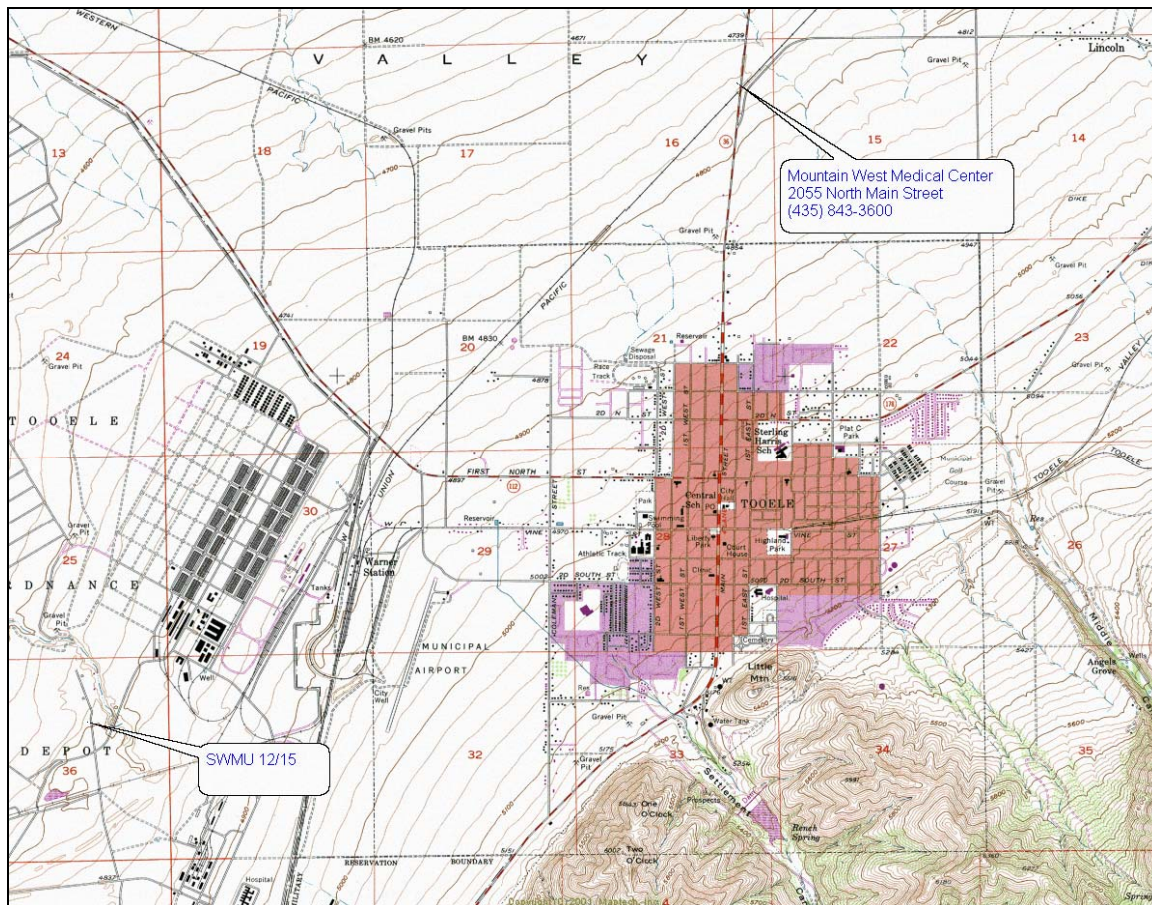


Figure 1

Mountain West Medical Center  
2055 North Main  
Tooele, UT  
(435) 843-3600

Take Hwy 36 North from the Tooele Army Depot main gate. Hwy 36 is Main in Tooele. The hospital is located north of the city.

A vehicle shall be available onsite during all work activities to transport injured personnel to the identified emergency medical facilities. A cellular telephone shall be available onsite during all work activities to summon emergency help. The contractor shall make a suitable first aid kit available at the site for use by trained personnel. The first aid kit shall contain enough supplies to service the number of people onsite and shall be approved by the occupational health physician. A supply of fresh water or potable emergency eyewash with a minimum 5-gallon capacity and 15-minute duration shall also be available at the work site. The contractor shall notify the medical facility to be used in emergencies of the approximate duration of work at the site, and provide a list of contaminants prior to beginning work.

## 2.8 Exposure Monitoring/Air Sampling Program

The contractor shall include in the SSHP an air sampling and screening program (personal and area) if conditions warrant. Personal monitoring is required if:

- a. An employee develops symptoms indicating possible exposure to hazardous substances.
- b. If the examining physician determines that surveillance is necessary.
- c. If the contractor's SHM requires sampling.

### 2.8.1 Visible Dust

It is generally recognized that total dust is visible at the 2 to 3 mg/M<sup>3</sup> concentrations. The contractor may use direct-reading air monitoring instruments (e.g., real-time aerosol monitor) to establish dust levels.

### 2.8.2 Personal Air Sampling

The contractor shall collect personal air samples for COPCs as applicable; the sampling program shall be supervised by the contractor's SHM. The samples shall be analyzed by a laboratory participating in the American Industrial Hygiene Association Proficiency Analytical Testing Program and shall have as fast a turn-around time as possible.

### 2.8.3 Dust Control

Dust controls including, but not limited to, engineering and administrative controls such as wetting the soil during excavation and soil handling to prevent wind blown dust, and selection of equipment and techniques to reduce dust creation will be critical to controlling exposures to the COPCs and total nuisance dust. These controls shall be implemented to control dust generation to a level not visible or if employees complain of wind-blown grit.

### 2.8.4 Noise Monitoring

The contractor's SSHP shall provide for the evaluation of noise from all field operations that may expose workers to noise levels at or above 85 dBA. The noise monitoring shall be sufficient enough to determine whether workers need to participate in a hearing conservation program and use hearing protection. Note that hearing protection is required for all exposures greater than 85 dBA.

### 2.8.5 Heat Stress Monitoring

The stress of working in a hot environment can cause a variety of illnesses including heat exhaustion or heat stroke; the latter can be fatal. Use of personal protective equipment can significantly increase heat stress. To reduce or prevent heat stress, the contractor shall, as required when ambient temperatures exceed 70 degrees Fahrenheit (°F), implement scheduled rest periods, and require beverage consumption to replace body fluids and salts. The contractor may use the following procedures and action levels, depending upon ambient site conditions:

- a. Heart Rate. Count the radial pulse during a 30-second period as early as possible in the rest period. If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same. If the heart rate exceeds 110 beats per minute at the next rest period, shorten the following work cycle by another third and also monitor oral temperature.

- b. Oral Temperature. Use a clinical thermometer (three minutes under the tongue) to measure the oral temperature at the end of the work period (before drinking). If the oral temperature exceeds 99.6° F, shorten the next work cycle by one-third without changing the rest period. If the oral temperature exceeds 99.6° F at the beginning of the next rest period, shorten the following work cycle by another third. Field team members shall not be allowed to wear Level C PPE when oral temperatures exceed 100.6° F.

#### 2.8.5.1 Symptoms of Heat Stress

Personal shall be trained to recognize the symptoms of heat stress and the appropriate action to take upon recognition. Even though physiological monitoring is not always necessary, it is essential that personnel understand the significance of heat stress and how to recognize it. The contractor should refer to the section on heat stress in the NIOSH/OSHA/USCG/EPA document “Occupational Safety and Health Guidance Manual for Hazardous Waste Sites Activities”.

#### 2.8.6 Cold Stress Monitoring

During the winter months, cold stress may be an occupational stress that needs consideration. Frostbite and hypothermia are the primary concerns. The SSHP shall contain information about the signs and symptoms of frostbite and describe work practices that will reduce the risk of injury. To reduce or prevent cold stress, the contractor shall, as required when ambient temperatures are below 40°F, implement work practices that will reduce the risk of injury due to frostbite or hypothermia. The contractor should use current guidance by the ACGIH in developing work practice controls.

#### 2.9 Standard Operating Safety Procedures, Engineering Controls, and Work Practices

The contractor’s SSHP shall address the implementation of feasible engineering and work practice controls to reduce and maintain employee exposure at or below the OSHA PEL for the COPCs. Specifically, the contractor’s SSHP must indicate methods of achieving the following:

- a. The buddy system.
- b. Prohibitions such as eating, drinking or smoking in the work zones.
- c. Required permits, such as for excavations, and hot work.
- d. Material handling procedures.
- e. Confined space entry; indicate negative declaration if no confined space entries will be required.
- f. Electrical Safety.
- g. Lockout/Tagout.
- h. Equipment guarding.
- i. Excavation and trench safety.
- j. Fall protection.
- k. Hazard Communication for chemicals brought to the site.
- l. Illumination.
- m. Work site sanitation.

#### 2.10 Site Control Measures

A contractor safety and health meeting shall be conducted prior to site entry and before commencement of field activities. The site shall be inspected for physical hazards. A discussion



of the work zone designation and the site entry requirements specific to each employee's task shall be included in each safety and health meeting.

#### 2.10.1 Security Procedures

Prior to field work, TEAD Security will be notified of the upcoming activity. Depot Security will provide visitor or contractor badges as needed for entrance onto the Depot. Badges are available for pre-authorized contractor and subcontractor personnel through the TEAD Security Office in Building 1000 (435) 833-2314. No one will be allowed to carry contraband, alcohol, firearms, weapons, or knives. To maintain security during non-working hours, the SSHO shall secure the site prior to leaving at the end of a working day. All equipment and supplies shall be secured or stored in locked facilities, and any open holes will be covered with appropriate materials.

#### 2.10.2 Regulated Areas

Site control requires the establishment of a regulated area, designated work zones, evacuation protocol, and site security. As long as the level of protection required is level D PPE, one work zone (regulated area) is sufficient. However, if the level of protection is upgraded to level C, an exclusion zone, contamination reduction zone, and support zone shall be established. The contractor's SSHP shall discuss the establishment of the regulated area(s). Additionally, the contractor's SSHP shall provide a map delineating the regulated area(s), and modify as site conditions warrant.

#### 2.10.3 Exclusion Zone

The exclusion zone (EZ), or "hot" zone is the zone where contamination or potential contamination exists. Since this zone has the potential for workers to be exposed to contaminants, all field staff entering this zone shall wear the appropriate PPE, and adhere to the training and medical surveillance requirements presented in this document. Areas with higher concentrations of contaminants within this zone shall be identified with field stakes with colored flags. Field personnel entering the EZ or the higher concentration part of the EZ shall enter and exit through a controlled center. Gross decontamination shall take place near the "hotline," before proceeding to the Contamination Reduction Zone (CRZ). Prior to fieldwork occurring in this zone, the SSHO shall develop an emergency exit area. The EZ shall be demarcated by using lines, placards, hazard tape and/or signs, or enclosed by physical barriers such as chains, fences or ropes.

#### 2.10.4 Contamination Reduction Zone

The CRZ is the zone where field staff and equipment shall undergo gross decontamination. This zone is located between the exclusion and support zones. The CRZ shall serve as a buffer to further reduce the probability of the clean zone becoming contaminated or being affected by other existing hazards. It shall provide additional assurance that the physical transfer of contaminants via personnel or equipment is limited through a combination of decontamination procedures and a minimum required distance between exclusion and support zones. Two lines of decontamination stations shall be set up within the contamination reduction corridor (the designated area within the CRZ where decontamination takes place), one for personnel and one for equipment.

As operations proceed, the area around the decontamination station may become contaminated, but to a much lesser degree than in the EZ. On a relative basis, the concentration of contaminants will decrease from the hotline to the support zone due to the distance involved and the decontamination procedures used. The “contamination control line” separating the CRZ and the support zone shall be designated with yellow or orange surveyor tape, or other suitable material.

#### 2.10.5 Support Zone

The support zone, the outermost part of the regulated area, is free from recognized site hazards. Support equipment such as the command post and safety vehicles shall be located in this area. Since normal work attire is appropriate within this zone, potentially contaminated personal protective clothing, equipment, and samples shall not be permitted. The location of the command post and other support facilities in the support zone at each site shall depend on a number of factors, including:

- a. Accessibility: topography, open space available, locations of roads, or other limitations.
- b. Visibility: line of sight to all activities in the EZ is preferable.
- c. Wind direction: the support facilities preferably should be located upwind of the EZ. Shifts in wind direction and other conditions may be such that an ideal location based on wind direction alone does not exist.
- d. Resources: water, electricity, places of refuge.

Access to the CRZ from the support zone shall be through a controlled access point. Personnel entering the CRZ to assist in decontamination shall wear the prescribed PPE. Re-entrance into the support zone will require removal of any PPE worn in the CRZ.

### 2.11 Site Security

#### 2.11.1 Authorized Personnel

Only authorized personnel shall be allowed to enter the restricted work area associated with the field activities. Access to the work area shall be controlled by the SSHO, who will establish the bounds of the regulated area. The following measures shall be taken to assure site security:

- a. All workers entering the regulated areas shall be subject to the provisions of the contractor’s SSHP. The SSHO shall have the responsibility and authority to enforce this requirement.
- b. All workers entering the restricted work zone shall have the appropriate training, PPE and respiratory protection, and shall be enrolled in an established medical surveillance program.
- c. A site Visitor’s Logbook, located in the support zone, shall be maintained.

#### 2.11.2 Site Control

To maintain security at the site during working hours, the Contractor shall:

- a. Control all site entrances/exits through the support zone through installation of appropriate safety barricades, signs, and/or signal lights.
- b. Establish a personnel identification system, including limitations to an individual’s approved activities.

- c. Be responsible for enforcing entry/exit requirements.
- d. Utilize temporary fencing where feasible.
- e. Post warning signs should the utilization of temporary fencing not be feasible.

#### 2.11.3 Communication Systems

Two types of communications systems shall be available for all workers assigned to field projects. The contractor's SSHP shall specify which types of communication systems will be available. One system shall ensure adequate communication between site personnel, and the other shall ensure the ability to contact personnel and particularly emergency assistance off the site.

#### 2.11.4 Internal Communication

Internal Communication is used to:

- a. Alert team members to emergencies.
- b. Pass along safety information, such as weather conditions that could affect heat stress, cold stress, or general safety, etc.
- c. Maintain site control.
- d. Facilitate site work by being able to call to the appropriate party for information without having to decontaminate the work party and equipment and secure the site.

#### 2.11.5 Verbal Communication

Verbal communication can be impeded by onsite background noise and the use of personal protective equipment. Thus, it is vital that pre-arranged signals of communication be arranged prior to the initiation of site activities, particularly when heavy equipment work is involved.

Common types of internal communication devices include:

- a. Radios.
- b. Noisemakers: bell, compressed air horn, megaphone, siren, whistle.
- c. Visual signals.

#### 2.11.6 External Communication

Primary means of external communication devices are telephones, radios, facsimile machines, and computer networks. External communication systems between onsite and offsite personnel are necessary to:

- a. Coordinate emergency response efforts.
- b. Report to upper management about site activities.
- c. Maintain contact with essential offsite personnel.

#### 2.12 Personal and Equipment Decontamination

Equipment that may require decontamination includes tools, heavy equipment, and certain protective equipment. All material and equipment used for decontamination must be disposed of properly. Disposable clothing, tools buckets, brushes, and all other equipment that is contaminated will be secured in appropriate specification drums or other containers and labeled. Clothing that will be reused, not completely decontaminated onsite, will be secured in plastic bags before being removed from the site.

### 2.12.1 Decontamination Procedures

Decontamination procedures are implemented as a means to control potential migration of chemicals or other site contaminants to clean areas, and to prevent personnel exposure to chemicals or pathogens that may contaminate clothing or protective gear. This may entail a “step-off” decontamination or a more detailed decontamination procedure. Personnel entering restricted work zones during activities must decontaminate upon exiting from the restricted work zone. All personnel, including visitors, must enter and exit the restricted work zone through the primary entrance/exit. In addition, before demobilization, contaminated equipment shall be decontaminated before it is moved from the restricted work zone. Any material generated during decontamination procedures shall be labeled and stored until final disposal arrangements are made.

Note: The type of decontamination solution to be used is dependent on the type of chemical or pathogenic hazards present. The contractor’s SSHP shall specify decontamination materials when they are different from ordinary soap and water. All personnel shall be required to wash their hands, face and other exposed skin areas with soap before eating, drinking, or smoking (unless specific procedures are in place to ensure that a drink can be taken without the possibility of contamination), and before leaving the contamination reduction zone. Decontamination solutions shall be changed daily (at a minimum), and collected and stored onsite until disposal arrangements are finalized.

### 2.12.2 Portable Equipment Decontamination

Equipment used in the restricted work zone in areas where contact with site contaminants is likely to occur shall be protected from contamination as much as possible by measures such as enclosure in plastic bags or by preventing contact with contaminated materials. Equipment decontamination shall be determined by the nature of the equipment and extent of contamination.

### 2.12.3 Gross Decontamination

Equipment moved from the restricted work zone before the end of the job shall undergo a gross decontamination step near the work site prior to proceeding to the support zone.

### 2.12.4 Heavy Equipment and Vehicle Decontamination

Heavy equipment and vehicle decontamination should involve scraping and rough brushing (broom-clean condition) to remove dirt and other visible contamination from the frame and tires.

### 2.12.5 Personal Decontamination

Before fieldwork begins, the SHM shall determine the need and design of decontamination procedures. All personnel leaving zones designated by the SSHO as having potentially coming into contact with hazardous levels of chemicals must follow the established decontamination procedures. If respirators are worn, they must be disinfected daily. All personnel shall go through decontamination before leaving the restricted work zone. All personnel should shower as soon as possible after leaving the site.

#### 2.12.6 Emergency Decontamination

Although it is not anticipated that emergency decontamination of personnel or heavy equipment will be necessary, emergency decontamination of site personnel may be necessary for medical reasons or in the event of major contamination by contact with contaminated material.

#### 2.13 Emergency Response Plan and Equipment

##### 2.13.1 Emergency Response Plan

As part of the SSHP, the contractor shall develop an emergency response and contingency plan for onsite emergencies. The contractor shall provide for emergency response equipment and first aid arrangements. At a minimum the contractor shall address the following:

- a. Pre-emergency planning.
- b. Personnel roles, lines of authority, training, and communication.
- c. Emergency recognition and prevention.
- d. Safe distances and places of refuge.
- e. Site security and control.
- f. Evacuation routes and procedures.
- g. Decontamination.
- h. Emergency medical treatment and first aid.
- i. Emergency alerting of response procedures.
- j. Critique of response and follow-up.
- k. Personal protective equipment and emergency equipment.

##### 2.13.2 Emergency Response Contacts

All emergency response issues such as fire, security, or emergency medical services are handled by dialing 911.

#### **Emergency Numbers**

Local Police/Fire/Ambulance/Medical	911
TEAD Fire Department and Paramedics	(435) 833-2015 or 911
TEAD Security	(435) 833-2314
TEAD Environmental Management Office	(435) 833-3504
62nd Ordnance Co. (EOD)	(435) 833-2962

#### Medical Emergency:

Mountain West Medical Center	
2055 North Main	
Tooele, UT	(435) 843-3600

Poison Control Center	(800) 222-1222
National Response Center	(800) 424-8802

Contractor Project Manager (TBD)  
Contractor Safety and Health Manager (TBD)  
Contractor Site Safety and Health Officer (TBD)

### 2.13.3 Spill and Discharge Control

The contractor shall be responsible for developing, implementing, maintaining, and supervising a comprehensive Spill and Discharge Control Plan. The plan shall be submitted to the CO for approval and shall be a component of the SSHP. This plan should provide contingency measures for potential spills and discharge from potentially hazardous onsite materials or trucks transporting hazardous materials offsite.

### 2.14 Accident Prevention

Any additional accident prevention plan topics not otherwise covered in this HSDA that are required by ER 385-1-92 shall be addressed in the contractor's SSHP. For example, EM 385-1-1 requires that an AHA be developed for each set of tasks. The AHA describes each step of each tasks, identifies the potential chemical, biological, and safety hazards associated with each step, and the controls to be implemented. Additionally, it lists equipment to be used, training, and inspection requirements. The contractor shall include in the SSHP an AHA for each tasks to be performed.

#### 2.14.1 Daily Safety Inspection

The contractor is responsible for conducting daily safety inspections to ensure that the SSHP is being followed and is effective.

#### 2.14.2 Accident Report

In the event of an accident, the CO shall be notified according to the following list, using ENG Form 3394 (March 99):

- a. Class A Accident: an accident in which the resulting total cost of property damage and personal injuries is \$1,000,000 or greater; or an injury or occupational illness resulting in a fatality or permanent total disability.
- b. Class B Accident: an accident in which the resulting total cost of property damage and personal injuries is \$200,000 or more but less than \$1,000,000; or an injury or occupational illness resulting in permanent partial disability; or when three or more personnel are hospitalized as inpatients as the result of a single occurrence.
- c. Class C Accident: an accident in which the resulting total cost of property damage and personal injuries is \$20,000 or more but less than \$200,000; a nonfatal injury that causes any loss of time from work beyond the day or shift on which it occurred; or a nonfatal occupational illness that causes loss of time from work or disability at any time.
- d. Class D Accident: an accident in which the resulting total cost of property damage is 2,000 or more but less than \$20,000.

### 2.15 Logs, Reports, and Recordkeeping

The contractor shall maintain logs and records that relate to all aspects of the contractor's SSHP implementation. These records shall be submitted to the CO. They should include:

- a. Training log of 40-hour initial HAZWOPER training.
- b. Supervisory certifications.

- c. 8-hour annual refresher training.
- d. Medical surveillance program certifying employee fitness for duty.
- e. First aid and CPR certification.
- f. Site-specific indoctrination.
- g. Tailgate meetings.
- h. Visitor register.
- i. Daily inspections (may be part of the quality control report).
- j. OSHA 300 log.
- k. Safety and health program documents, such as the SSHP.
- l. Equipment maintenance.
- m. Exposure assessment monitoring
- n. Permits and notifications

# **ATTACHMENT 3**

## **SWMU 12/15 SITE PHOTOGRAPHS**





Example of “Surface Litter” East of Guard Shack



Example of “Exposed Debris” in Southeast Leg of the Landfill



Looking Northeast Across Far South Leg. Surface Litter Area.



Gravel Embankment Along West Side of the South Leg. Density of Vegetation Related to Presence of Adequate Soil.





Typical Vegetation in Northeast Section



Closer Look at Vegetation in Northeast. Note Gravelly Soil





Debris Area at North Fence Line.



Low Spot in the Road through the Arroyo, North-Central Area. Slope From the Concrete Rubble Area on the Left.



Looking North Across the Asbestos Disposal Area.



Exposed Debris Area at Northwest Edge of the Concrete Rubble Site. Engineer Standing Next to Manhole to be Extended.





Exposed Debris Area at Northwest Edge of the Concrete Rubble Site.



CAMU Located in Northwest portion of the Landfill. View to the West-Southwest from the Top of a Gravel Pile.



Debris Pile at North Side of Abandoned Sewage Lagoons



Abandoned Sewage Lagoons, Looking Southwest.

# ATTACHMENT 4

## FIELD NOTE FORMS



Grid #	Surface Debris Comments (density, size, type, etc.)	Vegetation (density, type, etc.)	Topography	Erosion
A01	Banding, fiberglass junk on surface Photo 1	Grass, scattered thistle Gravelly surface soil shows through quite a bit	Flat	None
A02	Loose concrete, wood, big voids 2	Grass, scattered thistle Gravelly surface soil shows through quite a bit	Dip at edge into the large depression	Slumping?
A03	Depression East Boundary (Trench report) 3	More dense than above	Low spot in large depression in Arroyo	Will receive runoff if any
A04	Borrow area, A few isolated bits of debris – so sparse it's just litter	Borrow area	Flat	None
A05	Less debris than A04 Point at trench location	Same vegetation as A04, weed growing through gravelly soil	Flat gentle slop	None
A06PP	No surface debris, proposed borrow area Point at power pole	Borrow area	Flat gentle slop	None
A07	No surface debris Point at test trench 7 (4-23-93)	Borrow area	Flat gentle slop	None
A08	Somewhere near north boundary of borrow area No debris	Borrow area	Flat gentle slop	None
A09	No surface debris Bottom of slope from borrow area (draw)	Weeds A little more dense than borrow area	Bottom of Draw	None
A10	Surface debris steel, wood, some PCC Need fill in this small pocket	Weeds A little more dense than borrow area	Depression	None
A11	Debris in slope, steel quite dense (Cover)	Weeds A little more dense than borrow area	Slope	None

Grid #	Surface Debris Comments (density, size, type, etc.)	Vegetation (density, type, etc.)	Topography	Erosion
A12	Well building Light surface debris between A11 & A12	Weeds A little more dense than borrow area	Bottom of slope	None
A13	Light scattered debris Wood, Steel Photo 4 North to low spot in road	Light weeds	Gentle slope	None
A14	Particularly bad area of debris Styrofoam, rubber, wood, steel, shotgun shells, glass, aerosol cans, cloth Photo 5B looking west		Depression	None
A15	None On top of rise west of heavy debris depression 7 looking east to debris depression	Fairly sparse – a lot of cobble and gravel	Sloped generally at 30%	Possible but no debris Gravel may be stable
Photo only	Photo 8 Looking north – embankment of potential borrow – between road and south leg			
A16	Scattered debris – semi significant Consider picking up and consolidating in some of the more concentrated areas locally Old flight helmets	Fairly thick grass Scattered thistle	Low area gentle slope into it	None
A17	At fence Debris all the way to the fence Interior fence little debris apparent on other side	Grass Scattered thistle	Flat	None
A18	Fence corner SE Debris pretty trivial Photo 9 looking North along fence	Grass Scattered thistle	Depression about 15 – 20° rise to the west	None

Grid #	Surface Debris Comments (density, size, type, etc.)	Vegetation (density, type, etc.)	Topography	Erosion
A19	Fence end no debris			
A20	Bottom of depression at top of rise – no debris Trivial debris around edge near trench locations	Very little, mostly gravel	Steep drop to the east	Potential at drop Slope failure? Won't expose any debris
Photo only	Photo 10 looking east at arroyo across road Light debris in foreground			
A21	Along east fence trivial debris beg line E-W south of which pick up and consolidate	Gravelly, grass, some shrub	Higher point, flat locally	None
A22	Other end of line described above			
Photo	Photo 11 Looking SW from plateau above VSG1			
A23	Plateau above MW40 VSG1 No surface debris	Grass – Miscellaneous thistle Gravelly Photo 12 13	Flat	None
A24	Manhole at N end of landfill Trivial debris	Looks undisturbed, plenty of grass – some thistle	Flat	None
A25- A28	Corners of some kind of foundation or sump. Concrete and re-bar Photo 14 15 Debris scarce in areas – litter only	MW to NE	Flat	None

Grid #	Surface Debris Comments (density, size, type, etc.)	Vegetation (density, type, etc.)	Topography	Erosion
A29	Depression near trenches 14 & 15 Some debris locally here Asphalt, concrete, metal not heavy	Gravel, grass, thistle	Depression	None
A30	At TP14 Some surface debris Depression to south with semi-significant debris	Thick grass, some thistle Thick shrub to west and NE Less vegetation in depression	Gentle slope	None
	~ 70 ft North of TP14 – an area with decayed vegetation matting – some debris around edges – Topo does not match Photo 16 17 Looking N			
A31	Railroad rail and other stuff sticking out of bank To west debris peters out	Good grass, some thistle – shrub at top of rise and to the west	30° rise to north	None
A32	Low depression Fairly significant miscellaneous debris Good consolidation point	Green mat, grass, some thistle and shrub	Flat depression	None
A33	Low spot in road E of concrete rubble mountain No debris – big puddle Hillside – concrete – very sparse other	A lot of shrub to the west and grass Photo 18 looking N	Hillside to west	Not likely
Photo	Photo 19 On road S of VSG2 looking SW			
A34	None	Well vegetated – A lot of shrub to wade though with clearer spots	Flat	

Grid #	Surface Debris Comments (density, size, type, etc.)	Vegetation (density, type, etc.)	Topography	Erosion
A35	None A couple gravel piles 2 cy each to east ~ 100 ft. On road (badly decayed road)	A lot of grass and shrub	Flat	
A36	W of VSG2 No debris	Fairly dense grass Some creosote shrub	Flat	
A37	Just W of A36 Test pit location? Sink hole (small) here	Fairly dense grass Some creosote shrub	Flat	
A38 A39	Asbestos signs W boundary Photo 20 21	Heavy grass Sporadic shrub	Flat	
A40	In asbestos area Some minor debris here Rubber glove, wire wrapped black tubing ASG12 nearby	Plenty of grass and shrub	Flat – Slight depression	
A41	Minor bits of what looks like floor tile/linoleum ASG12 3 ft to south	Plenty of grass and shrub		
A42 A43	More minor bits of siding or flooring Stuff poking out of ground	Not much shrub Gravelly – grassy some thistle		
A44	Asbestos sign NE Minor surface debris in area	Plenty of grass Some peripheral shrubs	Low areas here Concrete structure 40 ft east	

Grid #	Surface Debris Comments (density, size, type, etc.)	Vegetation (density, type, etc.)	Topography	Erosion
A45	Maybe in south pond area No debris	Plenty of grass – sporadic shrub	Flat	
	Rubble in the rise at NW end of waste ponds – brick, concrete, wood, metal		Small rise	
	Sections of clay pipe at NE corner of ponds	Plenty of grass – sporadic shrub	Small rise	
A46	SW corner of ponds	Plenty of grass	Small rise	
A47	In asbestos area on rise No debris	Dense grass and low shrub	On rise	None
A48	Decayed wood, some black tubing, to south more scattered debris, easily picked up	A lot of shrub	Flat	
A49 A50	End of paved road W Endo of paved road E			
A51	SW of concrete pad in slight ditch A piece of corrugated aluminum sheet to east – otherwise none observed	Plenty of grass – some shrub		

Grid #	Surface Debris Comments (density, size, type, etc.)	Vegetation (density, type, etc.)	Topography	Erosion
	Just west of concrete pad Some bits of debris, fabric (asbestos?)		Flat	None
A52	N side of concrete area near top of sharp rise Slump area debris concrete, metal, etc. Localized to small area Photo 22 23 24	Lots of shrub and grass	Steep drop (short)	Slumping?
Photo	25 26 CAMU from rise of north side			
A53	From top of a big gravel pile N of CAMU No debris	Some shrub – not much grass	Steep sloped gravel pile	Slumping maybe Probably not
	Photo 27			
A54	Along “finger” at road level (secondary dirt road) miscellaneous scattered debris – not a lot Litter – not likely a sign of buried debris – further north a lot of liquid containers	A lot of shrub	Bottom of Arroyo	
A55	Along road NW of process area – South side at base of gravel pile. Scattered odds and ends – cable, wire, concrete	Very thick shrub gravel, windrow, grass	Below gravel slope Flat area	None

Grid #	Surface Debris Comments (density, size, type, etc.)	Vegetation (density, type, etc.)	Topography	Erosion
A56 A57	Slope up from road. Just west from fork into CAMU. Pretty dense surface debris		15 – 20° slope  57 small flat area	
A58 A59	North end of ponds Asphalt, concrete, brick Starting at 2 <sup>nd</sup> pond from east Survey point	Thick grass and some shrub around debris  Photo 28 looking W	Debris forms small slope	Slumping of debris maybe
	Photo 29 Ponds looking SW			
A60	Piles at N end of ponds (2 western) Some concrete and re-bar sticking out top – remove	Thick grass holds mound in place	Mound fairly steep	None



# **ATTACHMENT 5**

## **INSPECTION AND MAINTENANCE PLAN**

**INSPECTION AND MAINTENANCE PLAN  
SWMU 12/15 SANITARY LANDFILL/PESTICIDE DISPOSAL AREA  
TOOELE ARMY DEPOT, UTAH**

The corrective measures for SWMU 12/15 include soil and vegetative cover improvements, groundwater monitoring, and land use controls. This Inspection and Maintenance Plan (IMP) is required in order to ensure that the corrective measures remain in effect over the long term. Groundwater monitoring is being performed under a separate program, and the TEAD Land Use Master Plan incorporates the restrictions for SWMU 12/15. The focus of this IMP is the soil and vegetative cover and site security.

**Inspection Plan**

SWMU 12/15 will be inspected periodically to identify and document changes in the cover and the perimeter fence as they occur. Proper observation and documentation through inspection reports will enable rapid repair of the cover or fence, should it be necessary. Inspection frequencies, procedures, and documentation are provided for the perimeter fence, erosion damage, ponded water, and vegetative cover condition. Inspection schedules are shown in Table 1. Information necessary for documentation of the inspections is listed in Table 2. An inspection form is provided as Figure 1.

1) Perimeter Fence: The perimeter fence will be inspected semi-annually. Breaches in the fence, broken strands, or other damage will be documented on the inspection form and the approximate location will be marked on a site map. Fence repairs will be performed within 30 days after discovery of the requirement.

2) Erosion Damage: In the semi-arid environment in which TEAD is located, erosion will occur only after intense precipitation events. TEAD or contract personnel will inspect the surface of the landfill cover on foot for evidence of erosion at mid-wet season and after wet season or within 24 hours of a storm event with precipitation greater than ¼ inch in one hour. Corrective actions will be implemented within 30 days of observations of exposed debris, loss of vegetative control due to erosion, or other erosion damage greater than 3 inches in depth.

3) Ponded Water: TEAD or contract personnel will inspect the surface of the landfill cover on foot for evidence of ponded water at mid-wet season and after wet season or within 24 hours of a storm event with precipitation greater than ¼ inch in one hour. Infiltration through the soil cover and the buried debris may be accelerated due to increased volume of water in the ponded areas. Ponded areas of diameter greater than six feet will be documented on the inspection forms. Corrective action will be taken as appropriate to the specific depression within 30 days of discovery of ponding.

4) Vegetative Cover: TEAD or contract personnel will inspect the surface of the landfill cover on foot for evidence of damage to the vegetative cover semi-annually or within 24 hours of a storm event with precipitation greater than ¼ inch in one hour. Any areas showing evidence of dead, damaged, or stressed vegetation will be identified on the inspection forms, including location, size, and nature of damage. Re-planting will be performed as appropriate. The schedule for re-seeding may depend on season. Other erosion control measures may be necessary if re-planting is delayed. Monthly inspections will be made at re-planted areas until the vegetation is re-established.

5) Unusual Conditions: In addition to documenting fence condition, erosion, ponding, and vegetation, observations of any unusual conditions will be similarly documented. “Unusual conditions” include any conditions that may adversely affect the corrective measures that are not specifically addressed in this IMP.

## **Maintenance Plan**

This section describes a program of corrective maintenance designed to maintain the soil cover and perimeter fence at the landfill. Plans are presented for maintenance of the perimeter fence, eroded and ponded areas, settlement of soil cover, and vegetative cover.

1) Perimeter Fence Maintenance: Repairs to the fence may include replacing broken/missing strands of barbed wire, missing/damaged signage, tightening loose strands of barbed wire, replacing posts, replacing locks. Repair activities will be initiated within 30 days after observations of deficiency are made.

2) Erosion Damage: On areas of minor slope, gulying is the most likely form of potential erosion damage. Corrective action will be initiated within 30 days after discovery of gulying. Re-covering and re-vegetation will be performed. Erosion control matting may also be used. At areas of significant slope, slumping may occur if the ground becomes saturated. Upon discovery of slumped areas, an engineering design for corrective action will be prepared and implemented. Corrective action will commence after review and approval of the design by a geotechnical engineer. UDEQ will be notified of all repairs required.

3) Ponding: Subsidence in the landfill may result in observations of ponding. Additional soil will be brought in to fill the ponded areas within 30 days after discovery.

4) Vegetation: Since vegetation, for the purpose of erosion control, is a required component of the landfill cover, a certain amount of maintenance is necessary. Since the landfill cover has no engineered barrier layers to protect, maintenance will not include control of “undesirable species”. Maintenance is focused on ensuring vegetation remains viable to serve the purpose of erosion control. The need for maintenance will most likely be the result of erosion damage, or operation of equipment (drill rigs, etc.). If damage occurs, re-seeding will be the likely corrective action. In the event that die-off of vegetation is observed, investigation into the cause of the die-off will be performed before determining the corrective action. Soil

amendments may be necessary before re-seeding the area. UDEQ will be notified of any re-vegetation activities.

**Table 1**  
**SWMU 12/15 Landfill Cover Inspection Frequency**

<b>Item</b>	<b>Inspection Frequency</b>
Perimeter Fence	Semi-annual
Unusual Conditions	Semi-annual
Erosion Damage	Semi-annual/24 hr. post-precipitation
Ponded Water	Semi-annual/24 hr. post-precipitation
Vegetative Cover	Semi-annual

**Table 2**  
**SWMU 12/15 Landfill Cover Inspection Information**

<b>Item</b>	<b>Required Information</b>
Perimeter Fence	Barbed wire missing/broken/loose, damaged/missing signage, damaged posts, locks, location
Unusual Conditions	Description, location
Exposed Debris	Description, location, extent
Erosion Damage	Extent, location, depth of gully/slump
Ponded Water	Size, depth, location, time since last rain
Vegetative Cover	Nature of problem, extent, location

## SWMU 12/15 LANDFILL INSPECTION FORM

---

Inspector: \_\_\_\_\_ Inspection Date: \_\_\_\_\_  
Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_  
Weather Condition: \_\_\_\_\_

---

### INSPECTION TYPE (check one)

**Semi-annual** (items 1,4,5) \_\_\_\_\_ **Mid-wet season** (items 2-3) \_\_\_\_\_ **Post-wet season** (items 2-3) \_\_\_\_\_ **Monthly** (item 4) \_\_\_\_\_

Item No.	Inspection Item	Deficiency	Action Taken
1	Security Fence		
2	Erosion Damage		
3	Ponded Water		
4	Vegetative Cover		
5	Other Observations		

# **ATTACHMENT 6**

## **MUNITIONS AND EXPLOSIVES OF CONCERN (MEC) SUPPORT DURING CONSTRUCTION ACTIVITIES**

**Munitions and Explosives of Concern (MEC) Support During Construction**  
**Activities**

**SWMU 12/15 Sanitary Landfill/Pesticide Disposal Area,  
Tooele Army Depot, Tooele Utah**

**1.0** The following procedures and protocols will be followed during excavation of borrow area material and follow-on emplacement of borrow area material within the “fill in areas”. The work required under this project involves MEC Safety Support during the excavation at the borrow areas.

1.1 MEC support activities shall be conducted in full compliance with United States Army Corps of Engineers (USACE), Department of Army (DA), and Department of Defense (DoD) requirements regarding personnel, equipment, and procedures. (All MEC operations shall emphasize anomaly avoidance, whenever possible, and be performed in a manner consistent with the Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] and the National Contingency Plan [NCP]. Therefore, the administrative requirements of Federal, state, or local permits are not required for implementation of any MEC procedures, including on-site destruction of MEC, if required, but the substantive permit requirements must be fulfilled.)

1.2 The provisions of 29 CFR 1910.120 shall apply to all MEC-related actions taken at this site. In addition, MEC personnel involved in performing MEC tasks will be limited to a 10-hour workday and a 40-hour workweek. Two consecutive workweeks shall be separated by a minimum of 48 hours of rest.

1.3 Chemical Warfare Material (CWM)

1.3.1 During a comprehensive review of archival records, no evidence of potential existence of CWM or CWM byproducts within the MEC construction support area however in the event suspect CWM is encountered, all work will immediately cease and project personnel will be evacuated along cleared paths upwind from the discovery. MEC personnel shall assess the need to notify or evacuate any additional areas within proximity of the discovery. A team consisting of a minimum of two personnel shall immediately secure the area to prevent unauthorized access. Personnel should position themselves as far upwind as possible while still maintaining security of the area. Two personnel will continue to secure the site until relieved by an EOD or Technical Escort Unit.

1.3.2 The Unexploded Ordnance (UXO) team will notify Larry McFarland, TEAD Environmental Office, at (435) 833-3341 who in turn will notify the appropriate response authorities. Concurrently the UXO team shall notify the USACE. Reporting procedures will be in accordance with paragraph 4.5.9.3.

#### 1.4 Munitions and Explosives of Concern

There is no evidence of surface MEC and no evidence to indicate MEC being buried within the borrow areas and the landfill area. However, TEAD's history indicates munitions have been tested, demilitarized, and disposed of at numerous locations within the TEAD boundaries. Landfills, at many BRAC and Formerly Used Defense Sites (FUDS) have historically been areas where MEC have been located. Because of this the USACE takes a prudent course of action by conducting excavation and "fill-in" activities under the constraints of "Low Probability" of encountering MEC. This "Low Probability" course of action requires MEC Safety Support be present during excavation and "fill-in" activities.

1.4.1 If surface or subsurface MEC is encountered, the UXO team will make every effort to identify the item through visual examination of the item for marking and other identifying features such as shape, size, and external fittings. Items will not be moved



during the inspection until the fuse condition can be ascertained. If the condition is questionable, consider the fuse to be armed. The fuse is considered the most hazardous component of a MEC regardless of type or condition.

1.4.2 Any MEC that contains energetic material or possible energetic residue requires an EOD response. Suspect MEC or MEC that cannot be identified also requires an EOD response

1.4.3 The UXO team is not authorized to destroy MEC. In the event MEC is encountered that due to fusing or current condition presents an eminent hazard the UXO team will notify Larry McFarland, TEAD Environmental Office, at (435) 833-3341 who in turn will notify the appropriate response authorities. Concurrently the UXO team shall notify the USACE. While awaiting arrival of the response unit, the UXO team will ensure site security is maintained, ensure access to the item(s) is restricted and ensure non-essential personnel are denied entry. At the request of the responding unit, the UXO team may provide assistance to the response team.

## 1.5 Personnel Qualifications

A UXO team consisting of a minimum of two qualified MEC personnel (one MEC Technician III and one MEC Technician II) shall be used to provide safety support during construction activities in areas potentially contaminated with MEC.

Qualifications standards are defined in *Department of Defense Explosive Safety Board Technical Paper #18*. The UXO team should review any archival information available regarding the area of the proposed construction activities. The UXO team should meet with on-site management and construction personnel and conduct a general work and safety briefing prior to commencement of any on-site activities.

## 1.6 Method of Work Accomplishment.

1.6.1 The UXO team should physically preview the actual construction footprint with the on-site management of the construction contractor and discuss visual observations

and potential areas of concern. In the event MEC is discovered, the UXO team shall place flagging adjacent to the discovery for subsequent visual reference, select a course around the item, and lead project personnel out of the area.

1.6.2 During mechanical excavation within the borrow areas the UXO team will monitor all excavation activities. One member of the team should be positioned to the rear and upwind of the excavation equipment for continuous visual observation of activities. If the construction contractor unearths or otherwise encounters suspect MEC, all excavation activities will cease. The UXO team will assess the condition of the MEC to determine if disposal action is required. If disposal is required, no further excavation is allowed at that location until the MEC response team has destroyed or removed the MEC item. Once the item is removed, excavation may continue.

1.6.3 The UXO team shall also occasionally monitor the fill process to ensure MEC have not been transported and deposited within the fill area. If the UXO team encounters suspect MEC at the fill site, all excavation and fill activities will cease. The UXO team will assess the condition of the MEC to determine if disposal action is required. If disposal is required, no further excavation is allowed at that location until the MEC response team has destroyed or removed the MEC item. Once the item is removed, filling activities may continue.

#### 1.6.4 Excavation Operations Sequence of Tasks

- The UXO team may utilize hand held magnetometers to assist in identifying suspect anomalies. Prior to field use of magnetometers, MEC Technicians shall follow the guidelines of the manufacturer's operating manual for setup and test out procedures.

- Determine wind direction and speed. Streamers attached to a stationary object is a field expeditious method to monitor wind direction during excavation operations.
- MEC personnel will position themselves outside the swing arm radius of the backhoe and outside the area of moving equipment.
- MEC personnel will ensure all non-essential personnel are outside the perimeter of the 200-foot radius safety work zone.
- One UXO team member should be positioned to the rear and upwind of the excavation equipment for continuous visual observation of activities. If suspect material is encountered the MEC Technician will immediately halt operations and investigate the nature of the suspect item.
- The equipment operator and the UXO team will ensure communication signals are in place prior to starting excavations. The signals must include a “Stop Excavation” signal. The equipment operator must maintain visual contact with the UXO team.
- If MEC is discovered all operations shall cease. MEC Technicians shall follow the guidance provided in previous paragraphs.

## 1.7 MEC Documentation

The type of item, location (to include depth located), condition, amounts, and disposition of all MEC items will be recorded by the UXO team. All MEC containing energetic material or energetic residue will be photographed and all photographs will be included in the final report.

### 1.7.1 Daily Log

The UXO Team shall provide field notes and other documentation of daily MEC support activities to the Contractor's field team leader for inclusion in the daily reports.

#### 1.7.2 After Action Report

The UXO team shall prepare an After Action Report describing the activities completed, significant findings, and lessons learned. The report shall be submitted to the prime contractor for inclusion into the final project report.

#### 1.7.3 Report of Suspect CWM

If CWM is located, the UXO team shall prepare a "Discovery of Recovered Chemical Warfare Materiel (RCWM)" report for the TEAD Environment Office with copy to the USACE. Reporting format and guidelines will be provided to the Contractor.

#### 1.8 Safety

Prior to field activities commencing, a Site Safety and Health Plan (SSHP), prepared by the contractor, specifically addressing MEC Construction Support activities must be submitted to the USACE for review and approval.

## 2.0 REFERENCES

U.S. Army Corps of Engineers, Engineer Pamphlet EP 75-1-2, 20 November 2000.

*Munitions and explosives of concern (MEC) Support During Hazardous, Toxic, and Radioactive Waste (HTRW) Construction Activities*

*Department of Defense Explosive Safety Board Technical Paper #18.*

# **ATTACHMENT 7**

## **SWMU 12/15 BORROW AND FILL VOLUME CALCULATIONS**

Site Volume Table: Unadjusted Calculated with Land  
Desktop

Cut	Fill	Net	
cu.yds	cu.yds	cu.yds	Method
=====			
Site: borrow-c6 based on an excavation depth of 2.5'			
Stratum: borrow-c6 eg borrow area c6			
19290	50	19241 (C)	End area
19281	46	19234 (C)	Prismoidal
19111	28	19083 (C)	Grid

Desktop

Site Volume Table: Unadjusted Calculated with Land

Cut	Fill	Net	Method
cu.yds	cu.yds	cu.yds	
=====			
Site: 1-2			
Stratum: 1-2fg eg 1-2fg			
0	856	856 (F)	End area
0	753	753 (F)	Grid
0	859	859 (F)	Composite
Site: 3-4fg			
Stratum: 3-4fg eg 3-4fg			
0	1183	1183 (F)	End area
0	1171	1171 (F)	Prismoidal
0	1078	1078 (F)	Grid
Site: 5fg			
Stratum: 5fg eg 5fg			
0	754	754 (F)	End area
0	748	748 (F)	Prismoidal
0	675	675 (F)	Grid
Site: 8-9fg			
Stratum: 8-9fg eg 8-9fg			
114	5826	5712 (F)	End area
108	5817	5710 (F)	Prismoidal
77	5700	5623 (F)	Grid
Site: 10-11fg			
Stratum: 10-11fg eg 10-11fg			
161	1119	958 (F)	End area
156	1108	952 (F)	Prismoidal
107	1047	940 (F)	Grid
Site: 12-13fg			
Stratum: 12-13fg eg 12-13fg			
4	2676	2673 (F)	End area
3	2662	2659 (F)	Prismoidal
1	2543	2542 (F)	Grid
Site: 14fg			
Stratum: 14fg eg 14fg			
158	2134	1975 (F)	End area
152	2120	1967 (F)	Prismoidal
139	1944	1804 (F)	Grid

Site: 17-18

Stratum: 17-18fg	eg	17-18-fg		
		1	2278	2277 (F) End area
		0	2262	2261 (F) Prismoidal
		0	2107	2107 (F) Grid

Site: 19-20

Stratum: 19-20fg	eg	19-20fg		
		0	1465	1465 (F) End area
		0	1456	1456 (F) Prismoidal
		0	1297	1297 (F) Grid

Site: site-15-16

Stratum: 15-16fg	eg	15-16fg		
		0	790	790 (F) End area
		0	776	775 (F) Prismoidal
		0	660	660 (F) Grid





State of Utah

Department of  
Environmental Quality

Dianne R. Nielson, Ph.D.  
*Executive Director*

DIVISION OF SOLID AND  
HAZARDOUS WASTE  
Dennis R. Downs  
*Director*

JON M. HUNTSMAN, JR.  
*Governor*

GARY HERBERT  
*Lieutenant Governor*

CF: File-Restoration  
Larry McFarland - Action

7/24

March 22, 2005

Tom Turner, Chief  
Environmental Management Office  
Tooele Army Depot  
Tooele, Utah 84074-5000

**Re: Corrective Measures Work Plan, Sanitary Waste Landfill and Pesticide Disposal Area, Solid Waste Management Unit (SWMU) 12/15, Tooele Army Depot, Tooele, Utah**  
EPA #UT3213820894  
DSHW Log No.: 05.00590

Dear Mr. Turner:

We have completed our review of the subject document. Our comments are as follows:

Section 4.0, Technical Requirements (especially section 4.7, Borrow Area Excavation and Grading, and section 4.9, Soil Placement): It appears that extensive borrowing of soil material from uncontaminated areas of SWMU 12/15 is necessary in order to fill in exposed debris areas (around 100,000 yd<sup>3</sup>). While all pertinent areas are identified in Attachment 1 of the work plan, a map depicting the final, anticipated contours and drainage patterns is missing. Please submit a contour map indicating the anticipated, final shape of the terrain (including all borrow areas and fill areas), with a scale fine enough to discern a one-foot difference in elevation.

While constructing this map, and calculating the cut-and-fill requirements, we would like to encourage you to contemplate borrowing as much soil as possible in the "C6" borrow area, which could even be enlarged to the SWMU boundaries proper, and gradually sloped from the boundaries toward the fill areas. Hopefully, soils from that area, and, to a lesser extent, soils from the "C9" area, will be sufficient to cover all existing debris areas with the required two foot cover for this project. We would prefer to not have to borrow any soils at all from the "C5" area, if possible. A site walk, conducted on March 3, 2005, revealed that the vegetation along the uncontaminated area of the western portion of SWMU 12/15 ("C5" area) is well established, and it appears to be ecologically desirable to keep that area undisturbed.

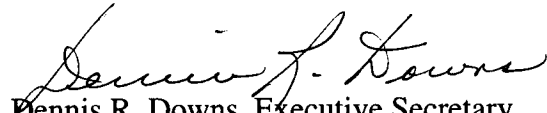
March 22, 2005

Page 2

We understand that topographic data will be provided as part of the requirements spelled out in Section 4.13; however, that map will show the true "as-built," elevations (after remediation is complete), not the anticipated elevations (as part of the work plan).

Thank you for your continuing and professional cooperation. Please respond to the above comments by April 22, 2005. If you have any questions, please contact Helge Gabert of my staff at (801) 538-6001.

Sincerely,

A handwritten signature in cursive script, appearing to read "Dennis R. Downs".

Dennis R. Downs, Executive Secretary  
Utah Solid and Hazardous Waste Control Board

DRD\HG\ts

c: Myron Bateman, M.P.H., R.S., Health Officer/Director, Tooele Co. Health Dept.  
Jim Kiefer, USEPA Region VIII  
Larry McFarland, TEAD  
Maryellen Mackenzie, U.S. Army Corps of Engineers, Sacramento  
Carl Cole, U.S. Army Corps of Engineers, TEAD



State of Utah

Department of  
Environmental Quality

Dianne R. Nielson, Ph.D.  
Executive Director

DIVISION OF SOLID AND  
HAZARDOUS WASTE  
Dennis R. Downs  
Director

JON M. HUNTSMAN, JR.  
Governor

GARY HERBERT  
Lieutenant Governor

cf. File (Restoration)  
Larry McFarland

TAT  
8/1

July 27, 2005

Tom Turner, Chief  
Environmental Management Office  
Tooele Army Depot  
Tooele, Utah 84074-5000

**Re: Corrective Measures Work Plan (Final), Sanitary Waste Landfill and Pesticide Disposal Area, Solid Waste Management Unit (SWMU) 12/15, Tooele Army Depot, Tooele, Utah**  
EPA #UT3213820894  
DSHW Log No.: 05.01929

Dear Mr. Turner:

We have completed our review of the subject document. All of our previous comments have been addressed satisfactorily. We understand that every effort will be made to ensure that no fill needs to be borrowed from the "C5" area, as the vegetation along the uncontaminated area of the western portion of SWMU 12/15 is well established, and it appears to be ecologically desirable to keep that area undisturbed.

The work plan is hereby approved. Please give us one week's notice before start-up of field activities, and keep us informed about remediation progress in a timely fashion. Thank you for your continuing and professional cooperation. If you have any questions, please contact Helge Gabert of my staff at (801) 538-6001.

Sincerely,

*for* Dennis R. Downs, Executive Secretary  
Utah Solid and Hazardous Waste Control Board

DRD\HG\ts

July 27, 2005

Page 2

- c: Myron Bateman, M.P.H., R.S., Health Officer/Director, Tooele Co. Health Dept.  
Jim Kiefer, USEPA Region VIII  
Larry McFarland, TEAD  
Maryellen Mackenzie, U.S. Army Corps of Engineers, Sacramento  
Carl Cole, U.S. Army Corps of Engineers, TEAD